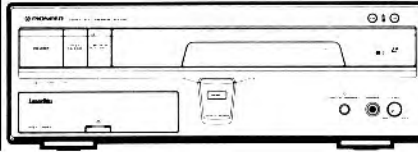


# Service Manual



ORDER NO.  
**ARP2757**

CD CDV LD PLAYER

# CLD-A100

CLD - A100 HAS THE FOLLOWING:

Type	Power Requirement	Remarks
KU	AC 120 V only	

- This manual is applicable to CLD - A100/KU.

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# 1. SAFETY INFORMATION

This service manual is intended for qualified service technicians; it is not meant for the casual do-it-yourselfer. Qualified technicians have the necessary test equipment and tools, and have been trained to properly and safely repair complex products such as those covered by this manual. Improperly performed repairs can adversely affect the safety and reliability of the product and may void the warranty. If you are not qualified to perform the repair of this product properly and safely, you should not risk trying to do so and refer the repair to a qualified service technician.



### WARNING

Lead in solder used in this product is listed by the California Health and Welfare agency as a known reproductive toxicant which may cause birth defects or other reproductive harm (California Health & Safety Code, Section 25249.5).

When servicing or handling circuit boards and other components which contain lead in solder, avoid unprotected skin contact with the solder. Also, when soldering do not inhale any smoke or fumes produced.



### NOTICE

(FOR CANADIAN MODEL ONLY)

Fuse symbols  (fast operating fuse) and/or  (slow operating fuse) on PCB indicate that replacement parts must be of identical designation.

### REMARQUE

(POUR MODÈLE CANADIEN SEULEMENT)

Les symboles de fusible  (fusible de type rapide) et/ou  (fusible de type lent) sur CCI indiquent que les pièces de remplacement doivent avoir la même désignation.

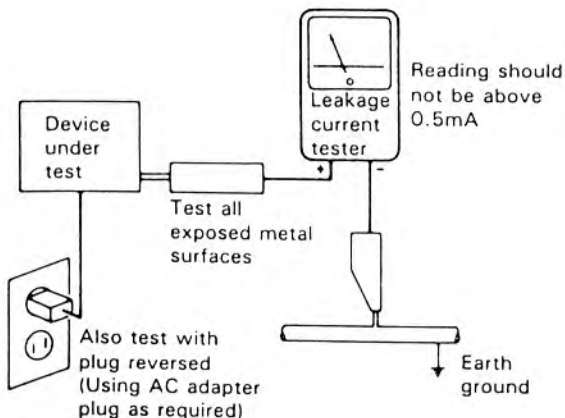
(FOR USA MODEL ONLY)

## 1. SAFETY PRECAUTIONS

The following check should be performed for the continued protection of the customer and service technician.

### LEAKAGE CURRENT CHECK

Measure leakage current to a known earth ground (water pipe, conduit, etc.) by connecting a leakage current tester such as Simpson Model 229-2 or equivalent between the earth ground and all exposed metal parts of the appliance (input/output terminals, screwheads, metal overlays, control shaft, etc.). Plug the AC line cord of the appliance directly into a 120V AC 60Hz outlet and turn the AC power switch on. Any current measured must not exceed 0.5mA.



AC Leakage Test

ANY MEASUREMENTS NOT WITHIN THE LIMITS OUTLINED ABOVE ARE INDICATIVE OF A POTENTIAL SHOCK HAZARD AND MUST BE CORRECTED BEFORE RETURNING THE APPLIANCE TO THE CUSTOMER.

## 2. PRODUCT SAFETY NOTICE

Many electrical and mechanical parts in the appliance have special safety related characteristics. These are often not evident from visual inspection nor the protection afforded by them necessarily can be obtained by using replacement components rated for voltage, wattage, etc. Replacement parts which have these special safety characteristics are identified in this Service Manual.

Electrical components having such features are identified by marking with a  $\Delta$  on the schematics and on the parts list in this Service Manual.

The use of a substitute replacement component which does not have the same safety characteristics as the PIONEER recommended replacement one, shown in the parts list in this Service Manual, may create shock, fire, or other hazards.

Product Safety is continuously under review and new instructions are issued from time to time. For the latest information, always consult the current PIONEER Service Manual. A subscription to, or additional copies of, PIONEER Service Manual may be obtained at a nominal charge from PIONEER.

## 2. DISASSEMBLY

### ● Removing the Tray Unit

1. Remove the two fixing screws  $\textcircled{Z}$  (Fig. 2-1).
2. Press the LD STOP OPEN/CLOSE button to set the tray unit to its OPEN position.
- \* When manually setting the tray unit to its OPEN position, refer to Notes 1 and 2.
3. Pull out the tray unit while pressing the hook  $\textcircled{A}$  (Fig. 2-1), located on the rear right side of the tray unit, to the left.

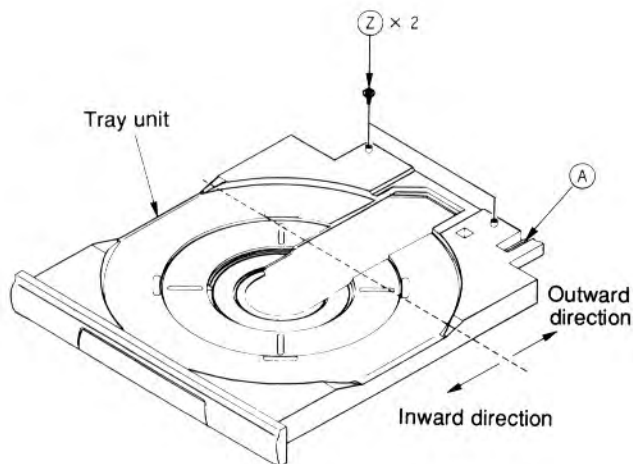


Fig. 2-1

Note 1. Manually setting the tray unit to its OPEN position

1. Remove the clamber holder unit  $\textcircled{B}$  (Fig. 2-2) by loosening its four screws.

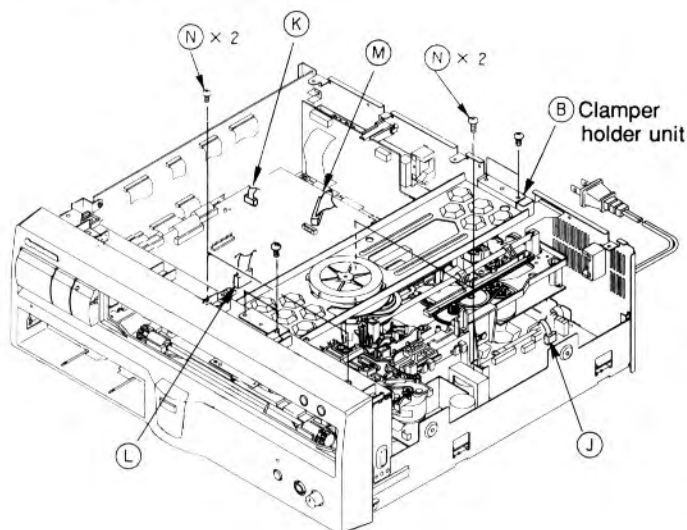


Fig. 2-2

2. Make sure that the position of the lens in the pickup assembly is such that the lens stops outside the position indicated by the dotted line in Fig. 2-1.

When the lens stops inside the dotted line, slowly press the  $\textcircled{Q}$  portion of the rack assembly (Fig. 2-3) to move the lens in the pickup assembly until the lens is outside the position indicated by the dotted line in Fig. 2-1.

Note that by not going through this process, opening the CD tray and removing the tray unit would be more time-consuming.

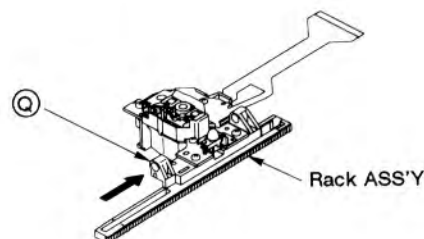


Fig. 2-3

3. Insert your hand through the right side of the tray unit and turn the gear pulley  $\textcircled{C}$  (Fig. 2-4) in a clockwise direction until the servo-mechanism unit  $\textcircled{D}$  (Fig 2-5) lowers. Keep turning the pulley until the tray unit starts to move towards the front.

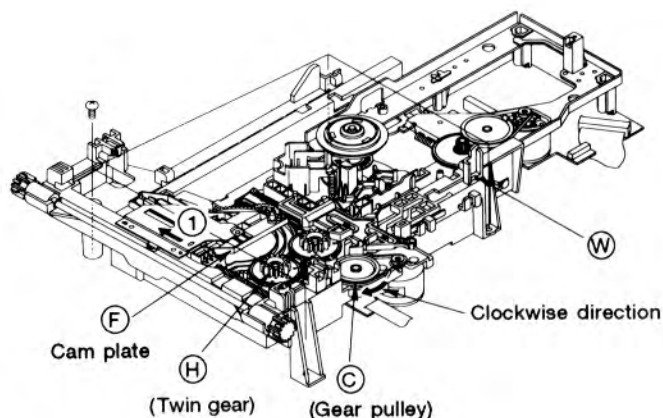


Fig. 2-4

4. Slowly pull out the tray unit to the OPEN position.

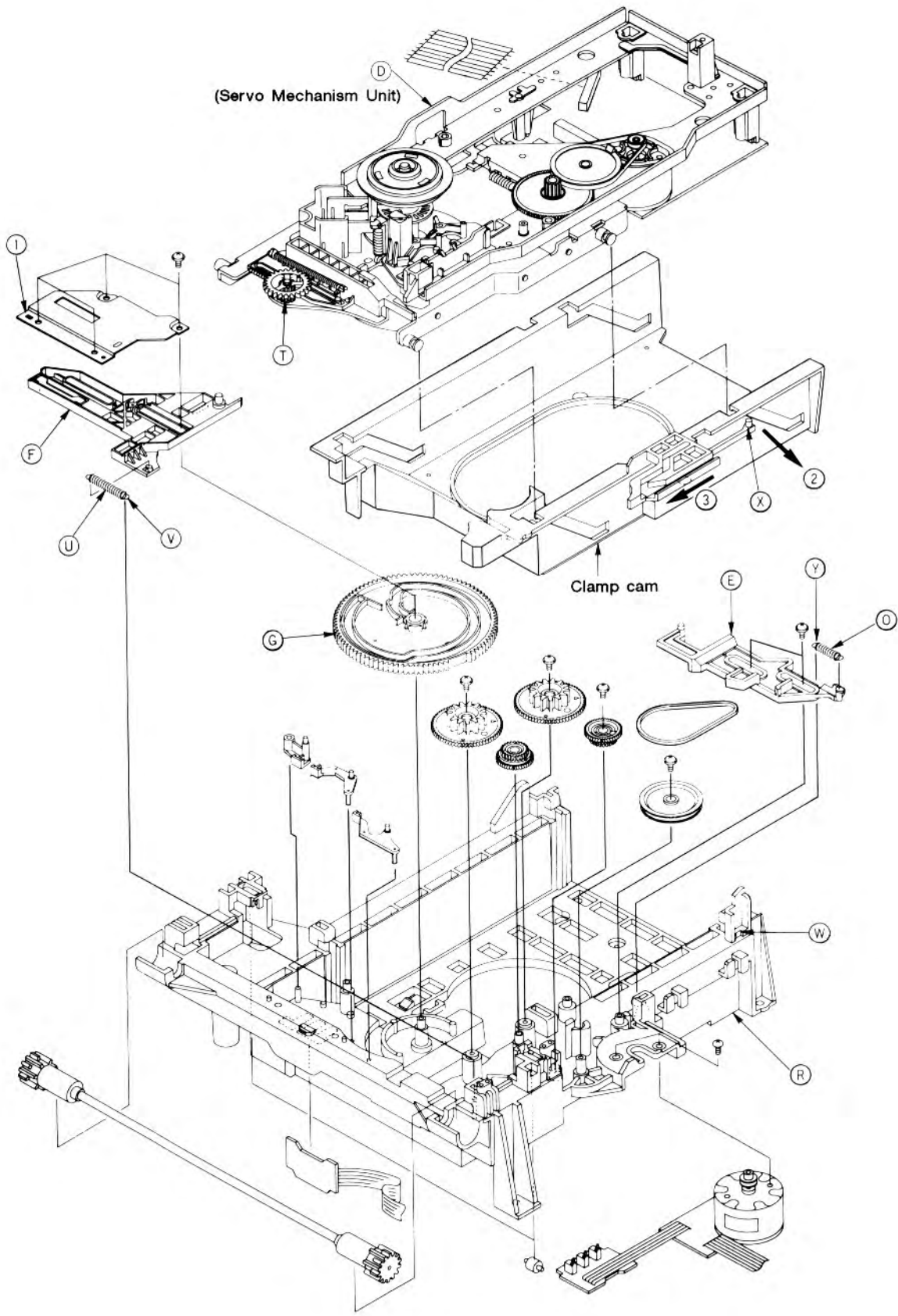


Fig. 2-5

Note 2. Setting the tray unit to its OPEN position when the CD tray is completely or partially OPEN

1. Remove the clamber holder unit (B) (Fig. 2-2) by loosening its four screws.
2. Slowly push in the CD tray to the CLOSE position.
3. Slowly press the (Q) portion of the rack assembly (Fig. 2-3) to move the lens in the pickup assembly until the lens is outside the position indicated by the dotted line in Fig. 2-1.
4. Insert your hand through the right side of the tray unit and turn the gear pulley (C) (Fig. 2-4) in a counterclockwise direction until the servo-mechanism unit (D) (Fig. 2-5) starts to move upward. Keep turning the pulley until the clamp position is reached (the LD tray and CD tray become one unit).
5. When the clamp position has been reached, turn the gear pulley (C) (Fig. 2-4) in a clockwise direction until the servo-mechanism unit (D) lowers. Keep turning the pulley until the tray unit starts to move towards the front.
6. Slowly pull out the tray unit to the OPEN position.

#### ● Attaching the Tray Unit

1. Make sure that the CD plate (E) is positioned to the left (LD tray mode) as in Fig. 2-6. When the CD plate (E) is positioned to the right (CD tray mode) as in Fig. 2-6, perform steps 1) to 2).

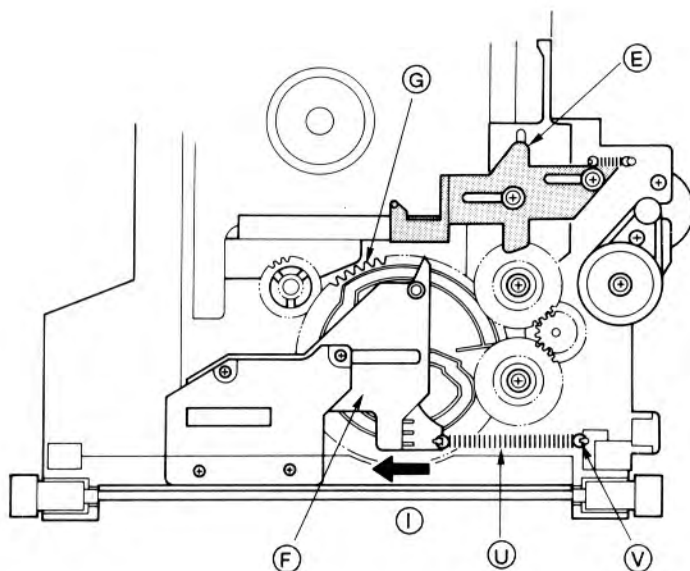


Fig. 2-6

- 1) Turn the power ON. After pickup assembly stopped, push cam plate (F) (Fig. 2-6) towards the direction of the arrow (I).
- 2) Wait until the cam gear (G) (Fig. 2-6) turns, the servo-mechanism unit (D) (Fig. 2-5) goes upward, and the pickup assembly stops moving.
2. Press the LD STOP OPEN/CLOSE button to open the tray unit, or pull out the power cord from the AC outlet and turn the twin gear (H) (Fig. 2-4) in a counterclockwise direction until the cam gear (G) (Fig. 2-6) can no longer turn.
3. Keeping the tray unit parallel with the front panel, slowly insert the tray unit through the opening of the front panel.

Note that if you insert the tray unit in the front panel when the tray unit and the front panel are not parallel with each other, the tray unit might get stuck while being inserted.

#### ● Removing the Servo-Mechanism Unit

1. Remove the clamber holder unit (B) (Fig. 2-2) by loosening its four screws, and remove the tray unit.
2. Remove the four connectors (J) to (M) (Fig. 2-2).
3. Remove the four fixing screws (N) of the mechanism base and remove the whole servo-mechanism unit from its casing.
4. Remove the (Y) side of the CDP spring (O) (Fig. 2-5) as well as the CD plate (E) by loosening the CD plate's two screws.
5. Remove the lead wire from the lead wire hook (S) (Fig. 2-7) for the spindle motor at the rear of the mechanism base (R).

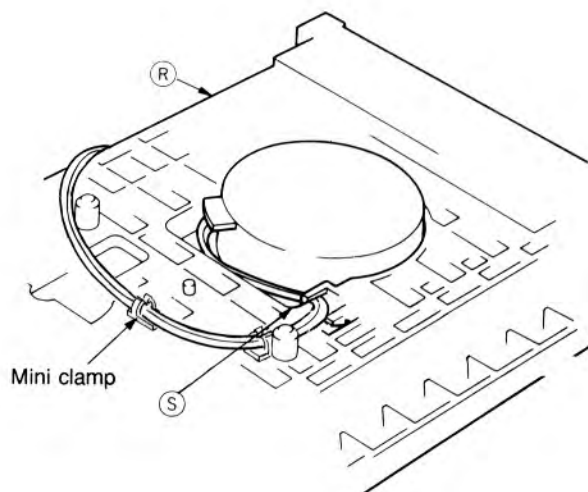


Fig. 2-7

6. While pushing the cam plate ⑥ (Fig. 2-4) towards the direction of the arrow ①, turn the twin gear ④ (Fig. 2-4) in a clockwise direction.
7. Stop turning the twin gear ④ (Fig. 2-4) when the servo-mechanism unit ① (Fig. 2-5) has gone upward and the Y-gear ① is engaged with the cam gear ③ by three to five teeth.
8. While bending the clamp cam hook ⑧ (Fig. 2-5) in the direction of the arrow ②, move the hook to its "built-in position" ⑦ (Fig. 2-4) towards the rear.
9. Lift the servo-mechanism unit ① straight up and remove the unit from the clamp cam (Fig. 2-5).

● **Attaching the Servo-Mechanism Unit**

1. Return the clamp cam and other parts to their original positions (when the servo-mechanism unit was removed).
2. While turning the Y-gear ① in a clockwise direction by three to five teeth (Fig. 2-8) in the same manner as when the Y-gear was removed, attach the servo-mechanism unit from above to the clamp cam (Fig. 2-5).
3. While bending the clamp cam hook ⑧ in the direction of the arrow ②, move the hook in the direction of the arrow ③ (Fig. 2-5).
4. While the servo-mechanism unit is raised, hook the lead wire from the spindle motor to hook ⑤ (Fig. 2-7) on the rear of the mechanism base ④.
5. Turn the twin gear ④ (Fig. 2-4) in a counterclockwise direction until the servo-mechanism unit lowers, the cam gear ③ (Fig. 2-5) stops turning, and the twin gear ④ (Fig. 2-4) runs idle.

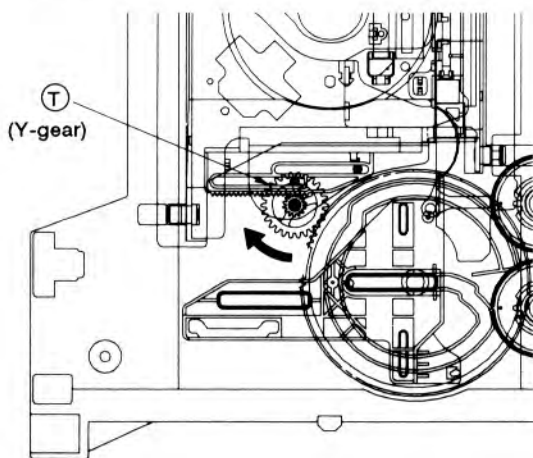


Fig. 2-8

● **Attaching the Cam Gear and Cam Plate**

1. Bring the clamp cam (Fig. 2-5) close towards you (while the servo-mechanism unit is being lowered).
2. Insert the cam gear ③ upon directing the rib horizontally as shown in Fig. 2-9.

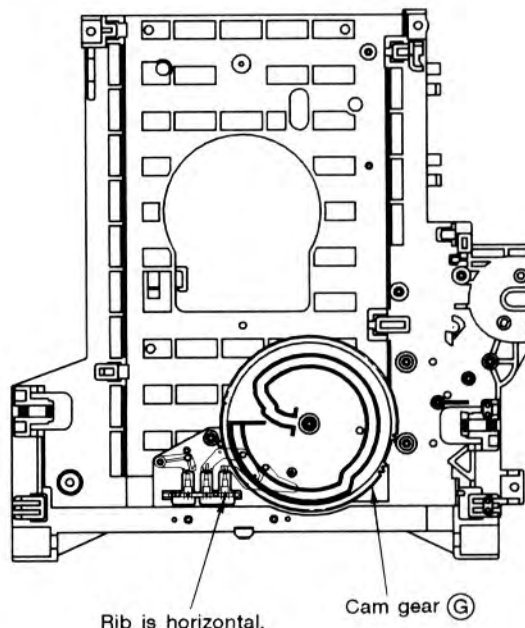


Fig. 2-9

3. Attach the CAS spring, ⑩ (Fig. 2-6) to the cam plate ⑥, and hook the ⑪ side of the CAS spring to the spring-latching part of the mechanism base.

- Slightly turn the cam gear ③ in a counterclockwise direction until the cam gear reaches the position shown in Fig. 2-10.

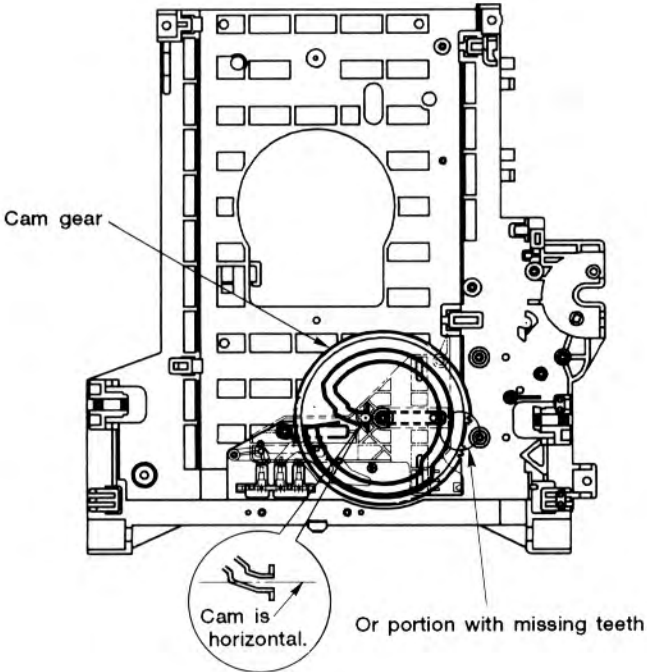


Fig. 2-10

● **Attaching the CD Plate**

- Upon attaching the CD spring ④ (Fig. 2-5) to the CD plate ⑤, hook the ⑥ side of the CD spring to the mechanism base hook.
- Attach the CD plate ⑤ (from the left side) into the position shown in Fig. 2-6.

- Attach the cam plate ⑦ on the cam gear ③ when the plate has moved to the rightmost position (Fig. 2-6).
- Fix the shaft holder ① using four screws (Fig. 2-5).

● **Matching the Position of the Gears**

- Attach the center gear ②, twin gears ⑧① and ⑧②, and Y-gear ⑨ in the positions indicated in Fig. 2-11.

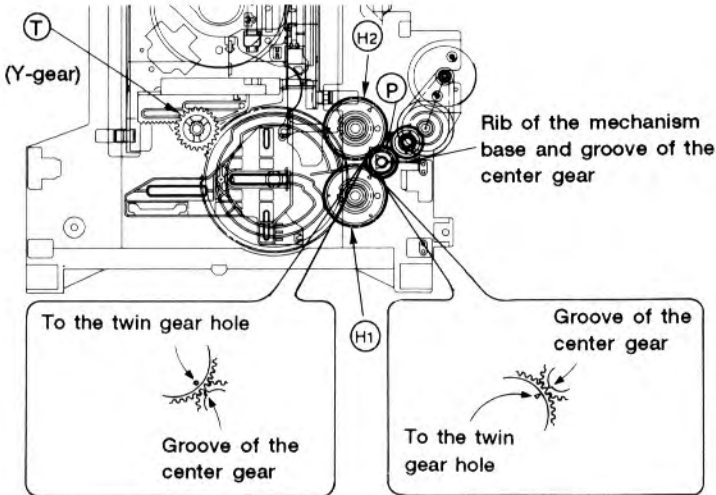


Fig. 2-11

### 3. EXPLODED VIEWS AND PARTS LIST

**NOTES:**

- Parts marked by "NSP" are generally unavailable because they are not in our Master Spare Parts List.
- The  $\Delta$  mark found on some component parts indicates the importance of the safety factor of the part. Therefore, when replacing, be sure to use parts of identical designation.
- Parts marked by "☉" are not always kept in stock. Their delivery time may be longer than usual or they may be unavailable.

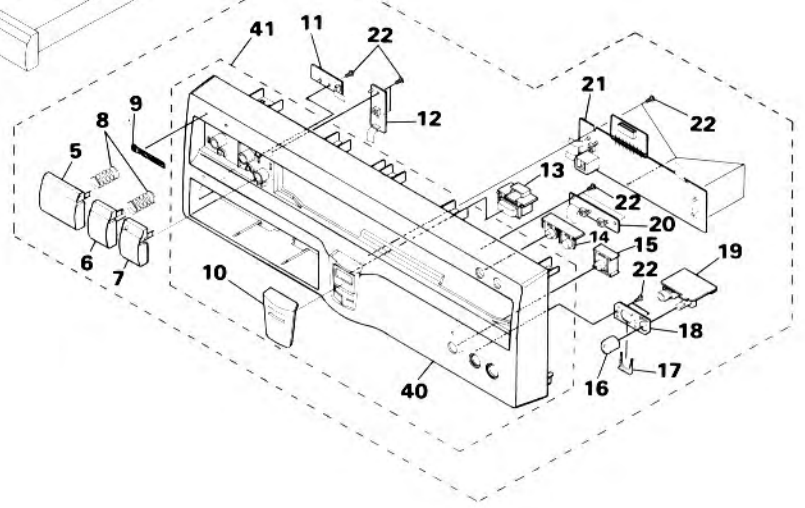
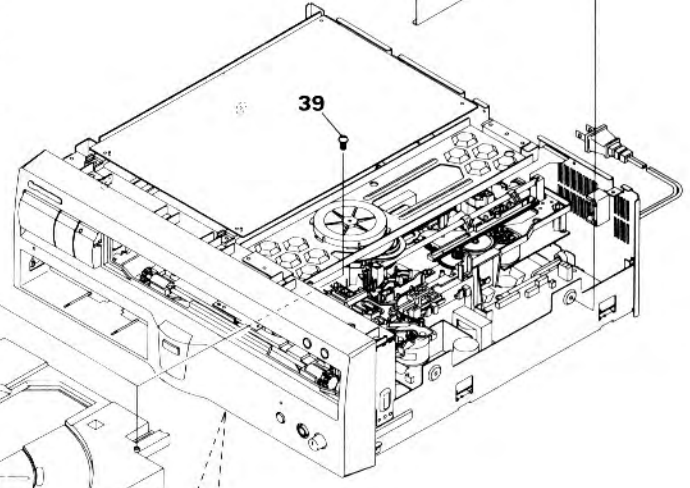
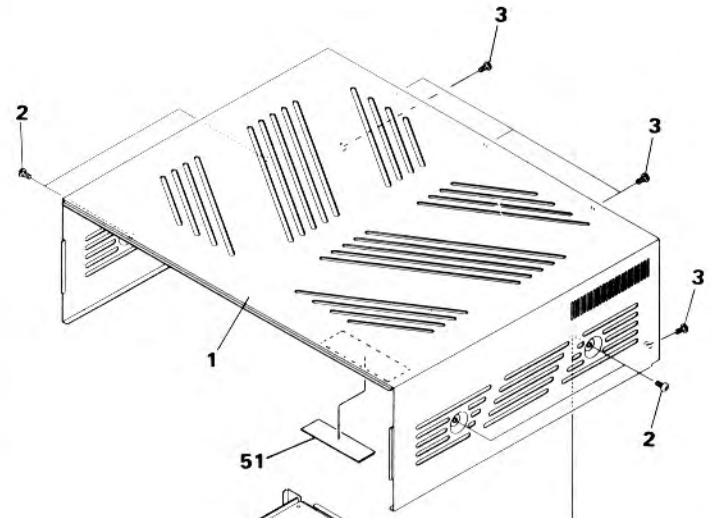
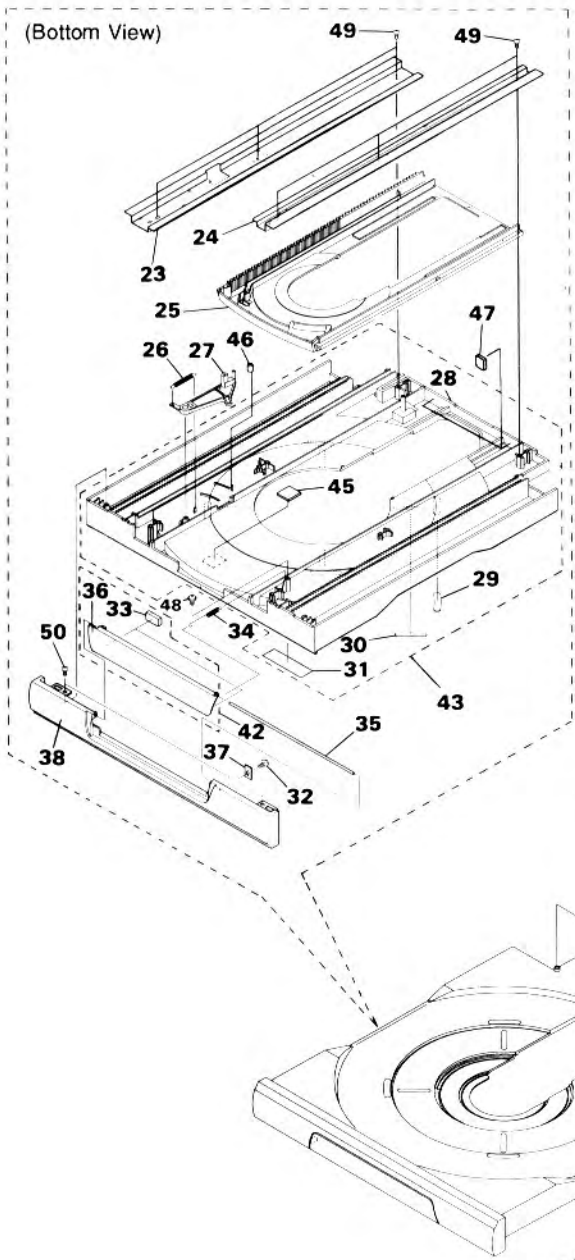
#### 3.1 EXTERIOR, DISC TRAY AND FRONT PANEL

Part List					
Mark No.	Description	Parts No.	Mark No.	Description	Parts No.
	1 Bonnet - S	DXX2120		26 Lock plate spring	VBH1188
	2 Screw	BCZ40P060FZK		27 Lock plate	VNL1513
	3 Screw	BBZ30P080FMC	NSP	28 LD tray	VNK1991
	4 .....			29 Disc pad (L)	VEC1191
	5 Power button	DNK2725		30 Disc pad (C)	VEC1380
	6 Release button	DNK2726	NSP	31 Carry label	VRW1289
	7 Play button ass'y	DXA1624		32 Screw	IPZ20P050FMC
	8 Panel spring	DBH1226		33 Carry cushion	VEC1578
	9 Name plate	VAM1032		34 Door spring	DBH1227
	10 IR panel	DNK2724		35 Door shaft	VLL1441
NSP	11 STBB ass'y	DWG1361	NSP	36 CD Door	DNK2733
NSP	12 PLYB ass'y	DWG1360		37 Door holder	VNE1812
	13 Reset button	DNK2728		38 LD door	DNK2732
	14 Eject button	DNK2730		39 Screw	VBA1032
	15 Through button	DNK2729	NSP	40 Front panel ass'y	DXA1623
	16 Volume knob	DNK2731		41 Front panel ass'y - S	DXX2119
	17 Snap plate	VNE1102		42 CD door ass'y - S	DXX2109
	18 Jack holder	VNE1811		43 Tray ass'y - S	VXX1729
NSP	19 HEPB ass'y	DWG1363		44 .....	
NSP	20 CLDB ass'y	DWG1362		45 Damp cushion	VEC1110
NSP	21 MAIN ass'y	DWG1359		46 Stop ring	VEB1091
	22 Screw	BPZ26P060FMC	NSP	47 Cushion	VEC1618
	23 Guide plate (R)	VNE1806		48 Screw	VBA1034
	24 Guide plate (L)	VNE1805		49 Screw	BPZ30P060FCU
	25 CD tray	VNK1992		50 Screw	BPZ30P080FCU
			NSP	51 65 label	ORW1069

**NOTE :** Screws adjacent to ▼ mark on product are used for disassembly.

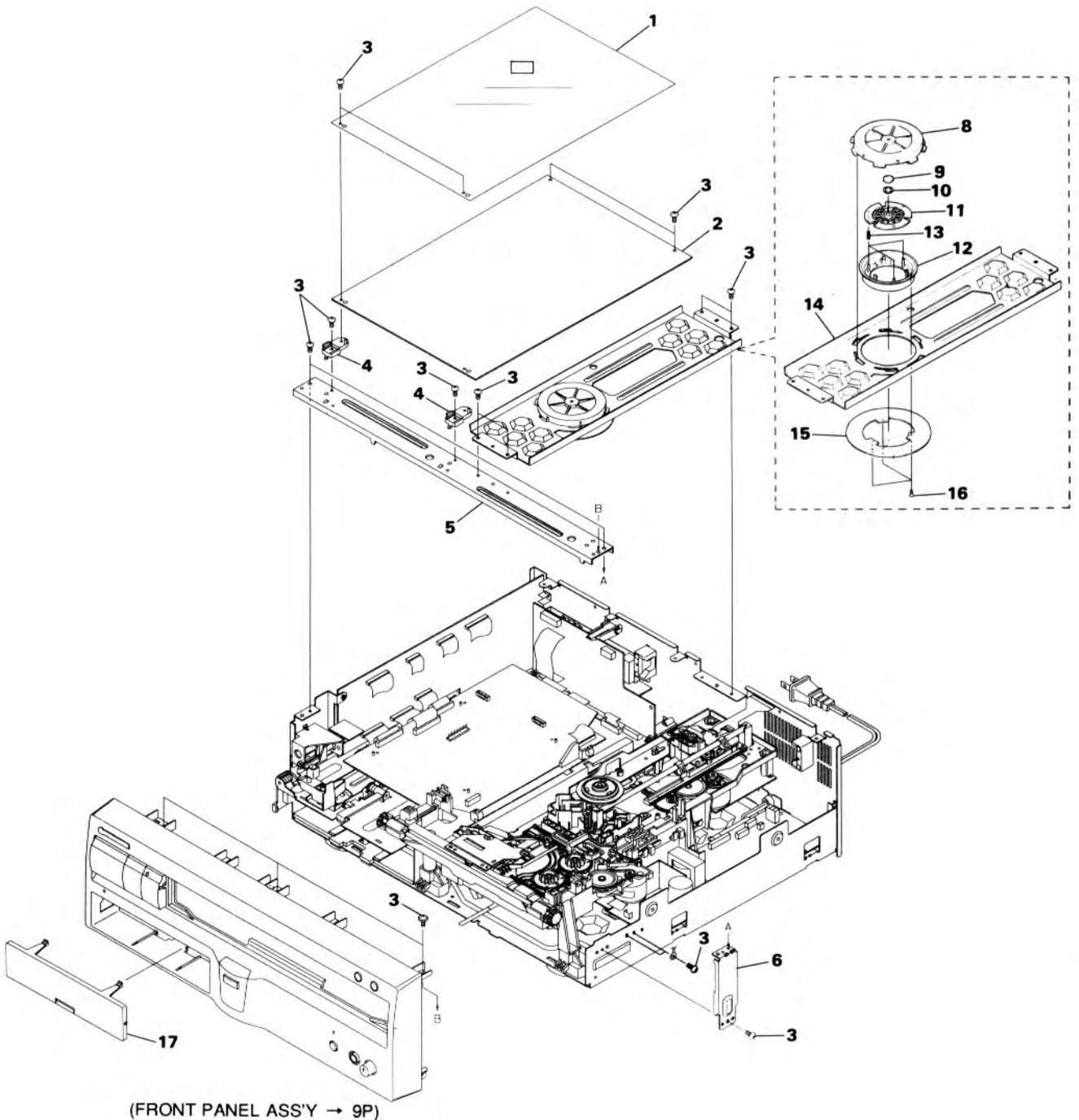


(Bottom View)



**3.2 TOP VIEW AND CLAMPER ASSY****Part List**

<b>Mark No.</b>	<b>Description</b>	<b>Parts No.</b>	<b>Mark No.</b>	<b>Description</b>	<b>Parts No.</b>
1	Sheet L	DEC1732	11	Clamper head	VNL1516
2	VIDEO ass'y	DWV1132	12	Clamper	VNL1515
3	Screw	BBZ30P080FMC	13	Clamper spring	VBH1192
4	Base S	DNK2742	14	Clamper arm	VNE1804
5	Front stay	DNE1207	15	Stabilizer	VNE1807
6	Side stay R	DNE1209	16	Screw	CPZ20P050FMC
7	.....		17	Pack port	DNK2743
8	Clamper holder	VNL1514			
9	Rubber sheet	VEB1114			
10	Ball holder	VNL1289			



(FRONT PANEL ASS'Y → 9P)

### 3.3 BOTTOM VIEW

#### Part List

<u>Mark No.</u>	<u>Description</u>	<u>Parts No.</u>
	1 .....	
NSP	2 Mech. ass'y	DWT1090
	3 Carriage shaft	VLL1434
	4 Flexible cable	DDD1074
	5 Screw	IPZ30P060FMC
	6 Screw	BBZ30P080FMC
	7 Rear panel	DNA1135
△	8 AC power cord	DDG1060
△	9 AC cord stopper	CM-22C
	10 Screw	BBZ30P080FMC
	11 .....	
	12 Tray stopper	VNL1519
	13 PCB stay	DNK2764
NSP	14 JACB ass'y	DWX1349
	15 .....	

A

A

B

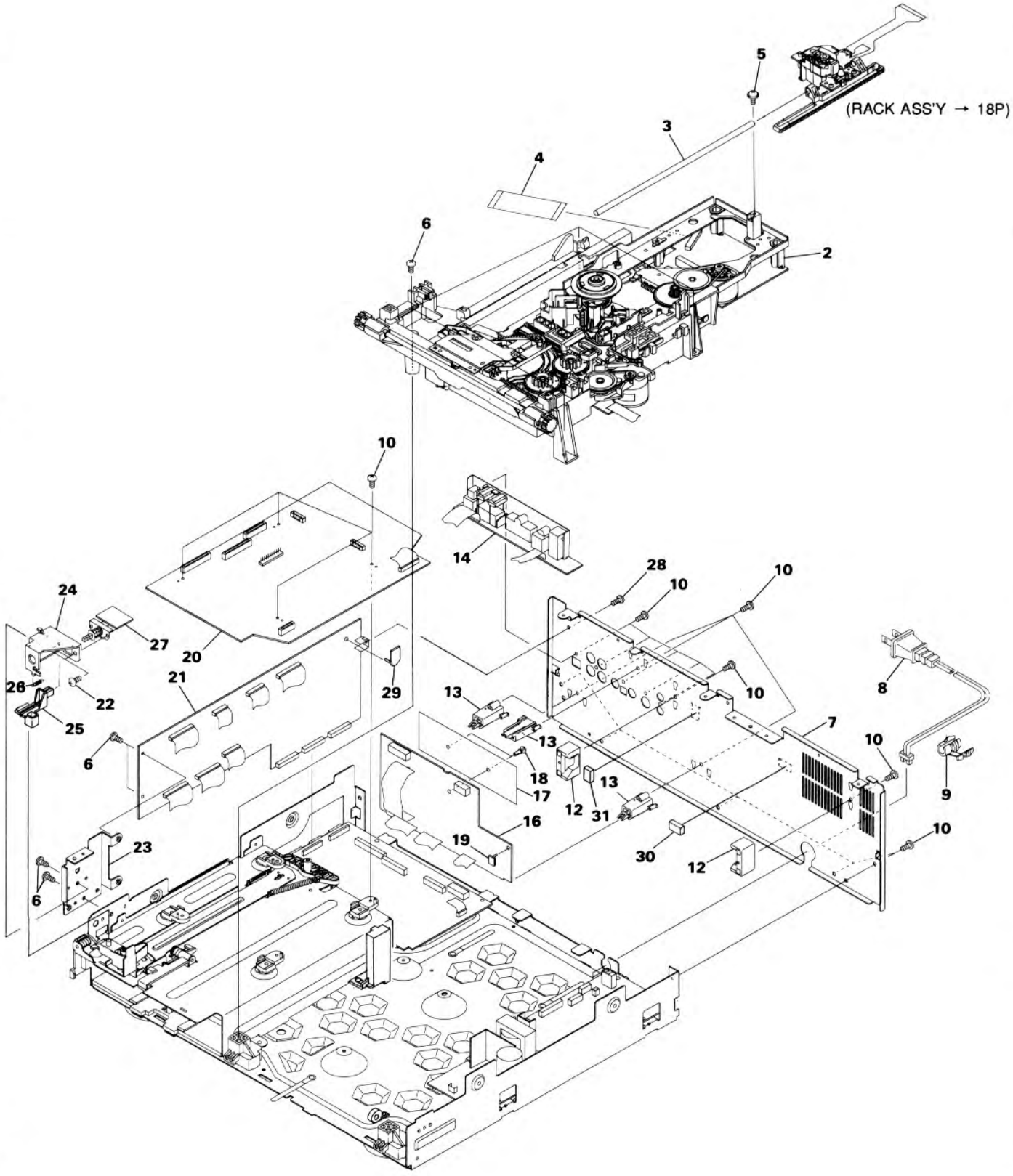
B

C

C

D

D



**3.4 PACK INSERT SECTION**

**Part List**

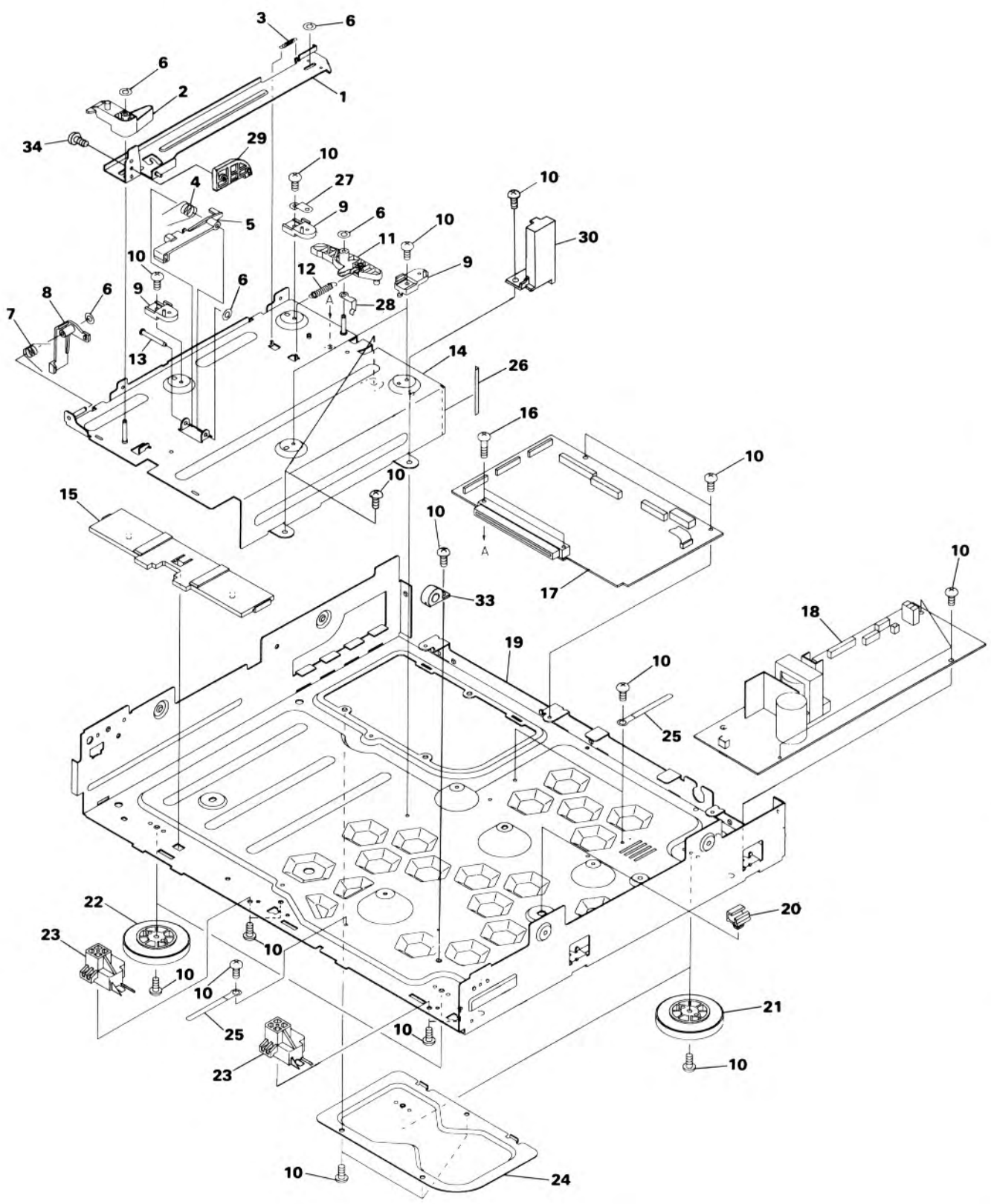
<b>Mark No.</b>	<b>Description</b>	<b>Parts No.</b>	<b>Mark No.</b>	<b>Description</b>	<b>Parts No.</b>
1	Slide plate ass'y	DXA1627		18 SYPS ass'y	DWR1156
2	Select lever	DNK2738	NSP	19 Chassis	DNA1125
3	Slide spring	DBH1229	NSP	20 P plate holder	PNY-405
4	Lock lever spring	DBH1230			
5	Lock lever	DNK2737		21 Insulator ass'y	DXA1491
				22 Insulator ass'y	VXA1881
6	Washer	WT26D070D050		23 Mech stay	DNK2765
7	Pack lever spring	DBH1231		24 Under panel	DNE1204
8	Pack lever	DNK2739	NSP	25 Cord holder	Z09-061
9	Base S	DNK2742			
10	Screw	BBZ30P080FMC		26 Seal A	DEC1363
				27 Earth angle	DNE1213
11	Eject lever	DNK2736	NSP	28 Earth plate	DNE1234
12	Eject lever spring	DBH1228		29 Slide guide	DNK2838
13	Lock lever shaft	DLL1011		30 Core holder	DNK2841
14	Shield case ass'y	DXA1626			
15	Pack base	DNK2735		31 .....	
				32 .....	
16	Screw	PMZ26P100FMC		33 Ring core	DTH1161
17	INTF ass'y	DWM1341		34 Screw	BPZ26P060FMC

A

B

C

D



A

B

C

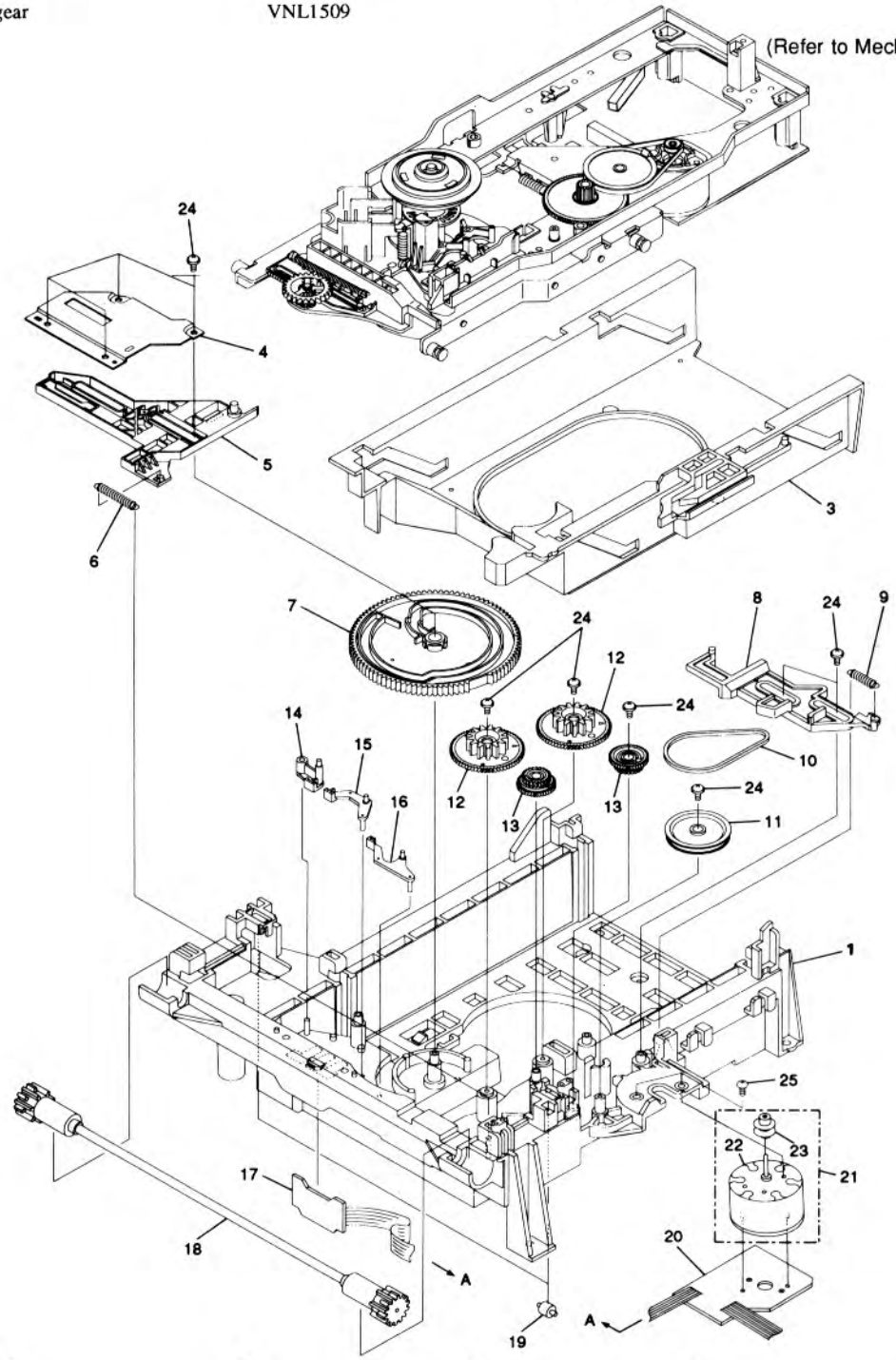
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### 3.5 MECHANISM ASSY (1/2)

#### Part List

Mark No.	Description	Parts No.	Mark No.	Description	Parts No.
1	Mechanism base	VNK1990	14	L-SW lever	VNL1504
2	.....		15	C-SW lever	VNL1505
3	Clamp cam	VNL1500	16	R-SW lever	VNL1506
4	Shaft holder	VNE1817	17	LOSB ass'y	DWG1357
5	Cam plate	VNL1511	18	Synchro gear ass'y	VXA1822
6	CAS Spring	VBH1190	19	Roller	VNL1042
7	Cam gear	VNL1507	20	LOMB ass'y	DWG1358
8	CD plate	VNL1512	21	Loading motor ass'y	VXX1712
9	CDP spring	VBH1191	22	Slider motor	VXM1033
10	Rubber belt	VEB1184	23	Motor pulley	PNW1643
11	Gear pulley	VNL1510	24	Screw	Z39-019
12	Twin gear	VNL1508	25	Screw	BMZ26P040FMC
13	Center gear	VNL1509			

(Refer to Mechanism ASSY (2/2))

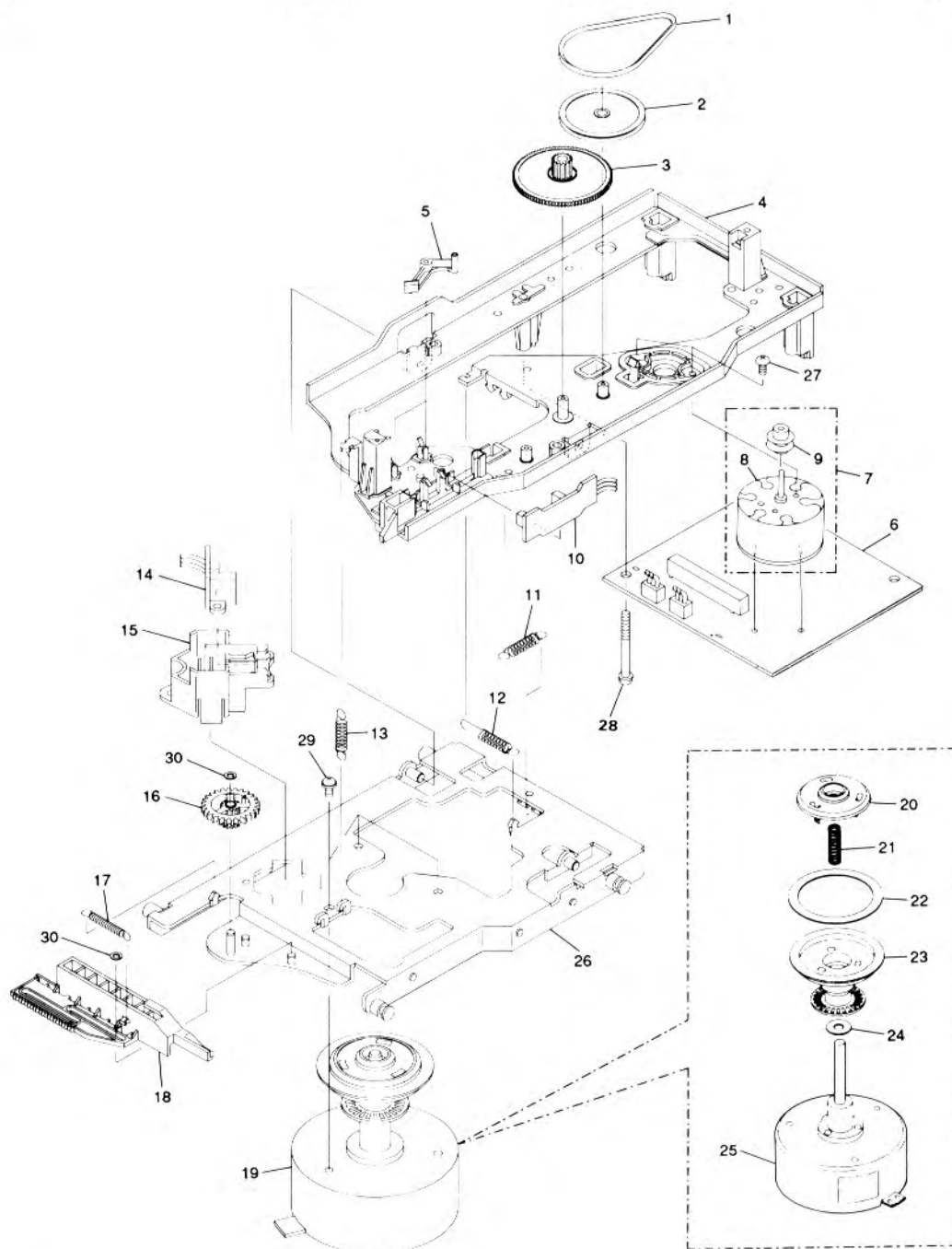




## 3.6 MECHANISM ASSY (2/2)

## Part List

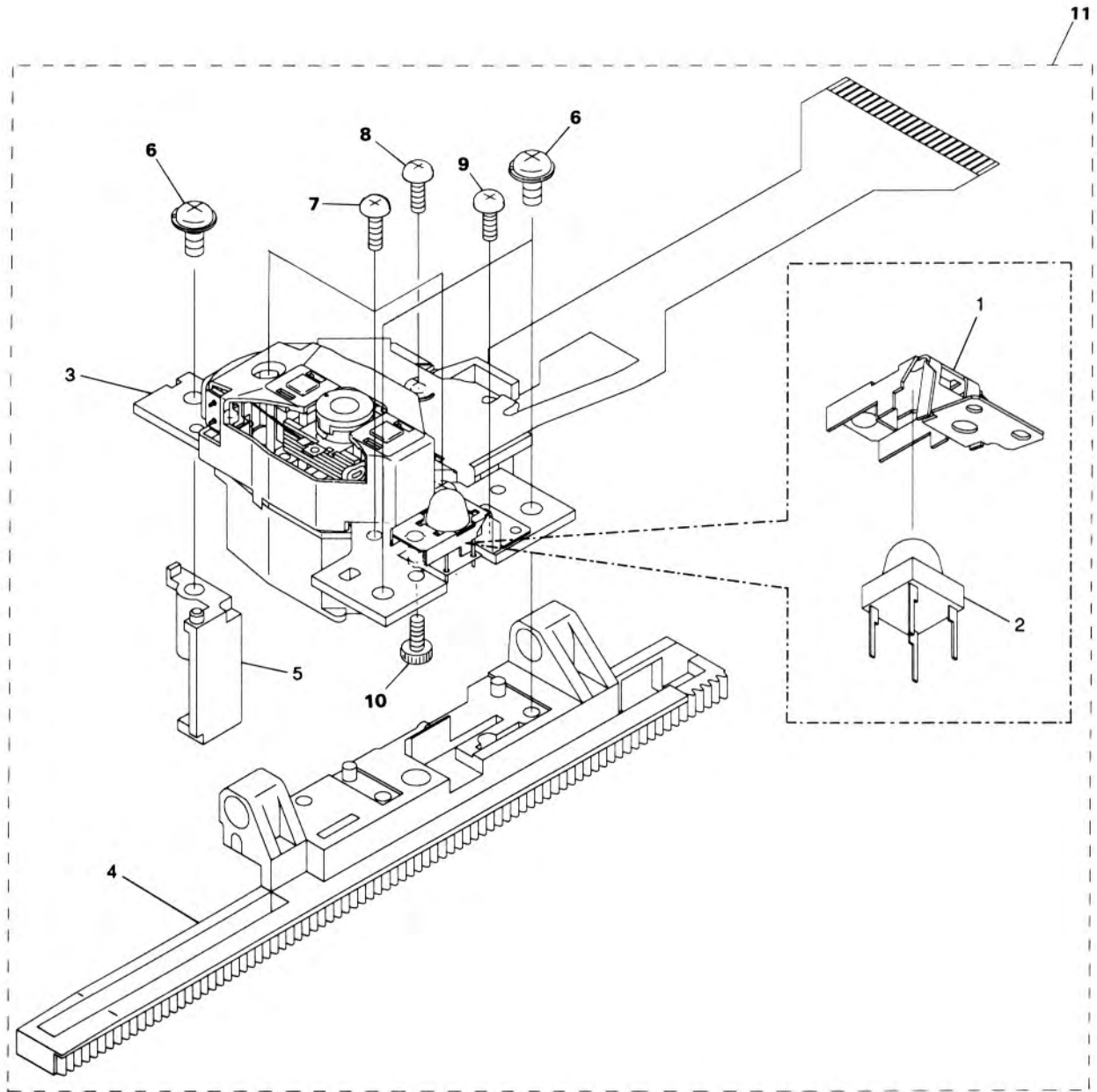
Mark No.	Description	Parts No.	Mark No.	Description	Parts No.
1	CA belt	VEB1077	16	Y gear	VNL1501
2	CA pulley (2)	VNL1496	17	Tilt cam spring	VBH1189
3	CA gear (3)	VNL1497	18	Tilt cam	VNL1502
4	Tilt base	VNL1499	19	Spindle motor ass'y	DXA1639
5	CA-SW lever	VNL1498	20	Centering hub	VNL1174
NSP	6 CAMB ass'y	DWG1356	21	Centering spring	VBH1083
NSP	7 CRG motor ass'y	VXX1261	NSP	22 Rubber sheet	VEB1103
NSP	8 Slider motor	VXM1033	NSP	23 Turn table ass'y	VXA1283
NSP	9 CA pulley (1)	VNL1197	NSP	24 Oil stopper	VBF1002
NSP	10 PKSB ass'y	DWG1355	NSP	25 Spindle motor	VXM1055
11	Radial spring	VBH1201	26	Motor base	VNE1803
12	Thrust spring	VBH1200	27	Screw	BMZ26P040FMC
13	Tilt tension	VBH1187	28	Screw	ABZ30P300FMC
NSP	14 FG ass'y	DWG1354	29	Screw	PMA30P050FMC
15	FG base	VNL1503	30	Washer	WT26D060D025



### 3.7 RACK ASSY

#### Part List

Mark No.	Description	Parts No.	Mark No.	Description	Parts No.
NSP 1	Sensor stay	VBK1036	9	Screw	PMH20P040FMC
NSP 2	Tilt sensor	SG-302	10	Screw	SMZ20H120FZK
NSP 3	Pick up ass'y	VWY1030	11	Rack ass'y	VWT1103
4	Rack	VNL1495			
5	TAN base	VNL1494			
6	Screw	PBB26P080FMC			
7	Screw	PMA20P060FMC			
8	Screw	PMA20P080FMC			



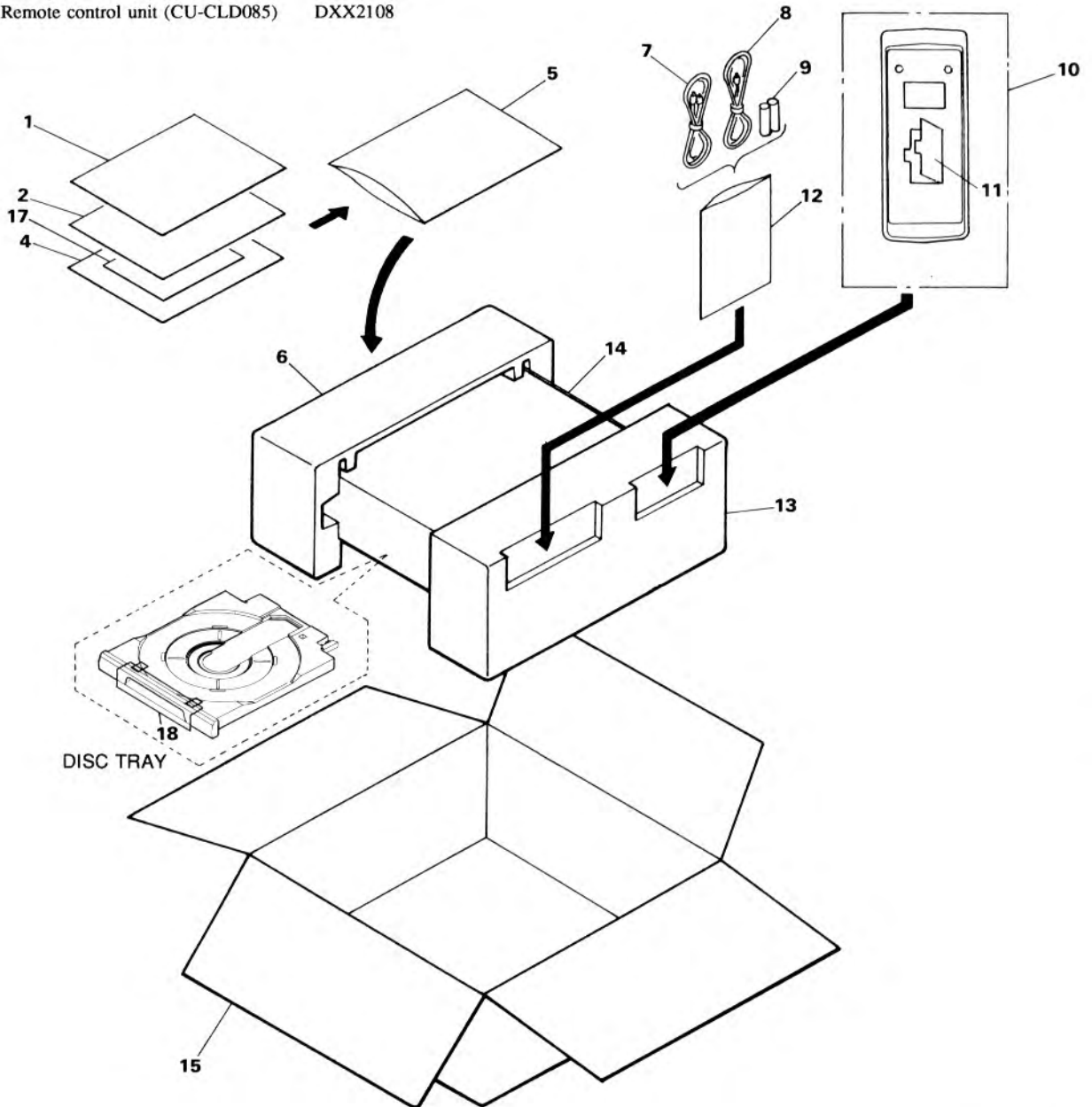
# 4. PACKING AND PARTS LIST

**NOTES:**

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- Parts marked by "●" are not always kept in stock. Their delivery time may be longer than usual or they may be unavailable.

**Part List**

Mark No.	Description	Parts No.	Mark No.	Description	Parts No.
	1 Operating instructions (English)	DRB1141		11 Battery cover	DNK2766
NSP	2 Caution (UC)	VRM1026	NSP	12 Polyethelene bag	Z21-029
	3 .....			13 Pad (R)	DHA1237
NSP	4 Caution	VRR1009		14 Mirror mat	VHL1012
NSP	5 Polyethelene bag	VHL-014		15 Packing case	DHG1512
	6 Pad (F)	DHA1236		16 .....	
	7 Connection cord	VDE-055	NSP	17 Warranty card	ARY1044
	8 Video cable	VDE-056		18 Mirror mat sheet	DHL1082
NSP	9 Battery(AAA, R03)	VEM-022			
	10 Remote control unit (CU-CLD085)	DXX2108			




DISC TRAY

# 5. SCHEMATIC AND PCB CONNECTION DIAGRAMS





## NOTE FOR SCHEMATIC DIAGRAMS (Type 4A)

- When ordering service parts, be sure to refer to "PARTS LIST of EXPLODED VIEWS" or "PCB PARTS LIST".**
- Since these are basic circuits, some parts of them or the values of some components may be changed for improvement.
- RESISTORS:**  
Unit: k: kΩ, M: MΩ, or Ω unless otherwise noted.  
Rated power: 1/4W, 1/6W, 1/8W, 1/10W unless otherwise noted.  
Tolerance: (F): ±1%, (G): ±2%, (K): ±10%, (M): ±20% or ±5% unless otherwise noted.
- CAPACITORS:**  
Unit: p: pF or μF unless otherwise noted.  
Ratings: capacitor (μF)/ voltage (V) unless otherwise noted.  
Rated voltage: 50V except for electrolytic capacitors.
- COILS:**  
Unit: m: mH or μH unless otherwise noted.

## 6. VOLTAGE AND CURRENT:

-  or  $\pm V$  :  
DC voltage (V) in PLAY mode unless otherwise noted.
- $\Rightarrow$  mA or  $\leftarrow$  mA :  
DC current in PLAY mode unless otherwise noted.  
Value in ( ) is DC current in STOP mode.

## 7. OTHERS:

-  or  : Adjusting point.
-  : Measurement point.
- The  mark found on some component parts indicates the importance of the safety factor of the parts. Therefore, when replacing, be sure to use parts of identical designation.


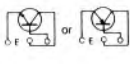

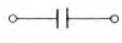

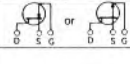

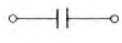







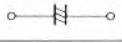







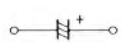







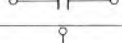



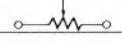





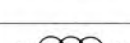



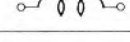


## 8. SCH-□ ON THE SCHEMATIC DIAGRAM:




- SCH-□ indicates the drawing number of the schematic diagram. (SCH stands for schematic diagram.)

## 9. SWITCHES (Underline indicates switch position):

- |                       |                             |
|-----------------------|-----------------------------|
| MAIN ASSY             | PWSW ASSY                   |
| S101 : DIGITAL MEMORY | S101 : POWER ON— <u>OFF</u> |
| S102 : RESET          | PKSB ASSY                   |
| PLYB ASSY             | S4 : PARK IN                |
| S201 : PLAY           | S5 : PARK OUT               |
| CLDB ASSY             | LOSB ASSY                   |
| S401 : CD EJECT       | S1 : SW1                    |
| S402 : LD EJECT       | S2 : SW2                    |
|                       | S3 : SW3                    |

## NOTE FOR PCB CONNECTION DIAGRAMS

P.C.B. pattern diagram indication	Corresponding part symbol	Part name	P.C.B. pattern diagram indication	Corresponding part symbol	Part name
		Transistor			Ceramic capacitor
		FET			Mylar capacitor
		Diode			Styrol capacitor
		Zener diode			Electrolytic capacitor (Non polarized)
		LED			Electrolytic capacitor (Noiseless)
		Varactor			Electrolytic capacitor (Polarized)
		Tact switch			Electrolytic capacitor (Polarized)
		Inductor			Power capacitor
		Coil			Semi-fixed resistor
		Transformer			Resistor array
		Filter			Resistor
		Resonator			Thermistor

- This P.C.B. connection diagram is viewed from the parts mounted side.
- The parts which have been mounted on the board can be replaced with those shown with the corresponding wiring symbols listed in the above Table.
- The capacitor terminal marked with  shows negative terminal.
- The diode marked with  shows cathode side.
- The transistor terminal marked with  shows emitter.

5.1 OVERALL WIRING DIAGRAM

A

B

C

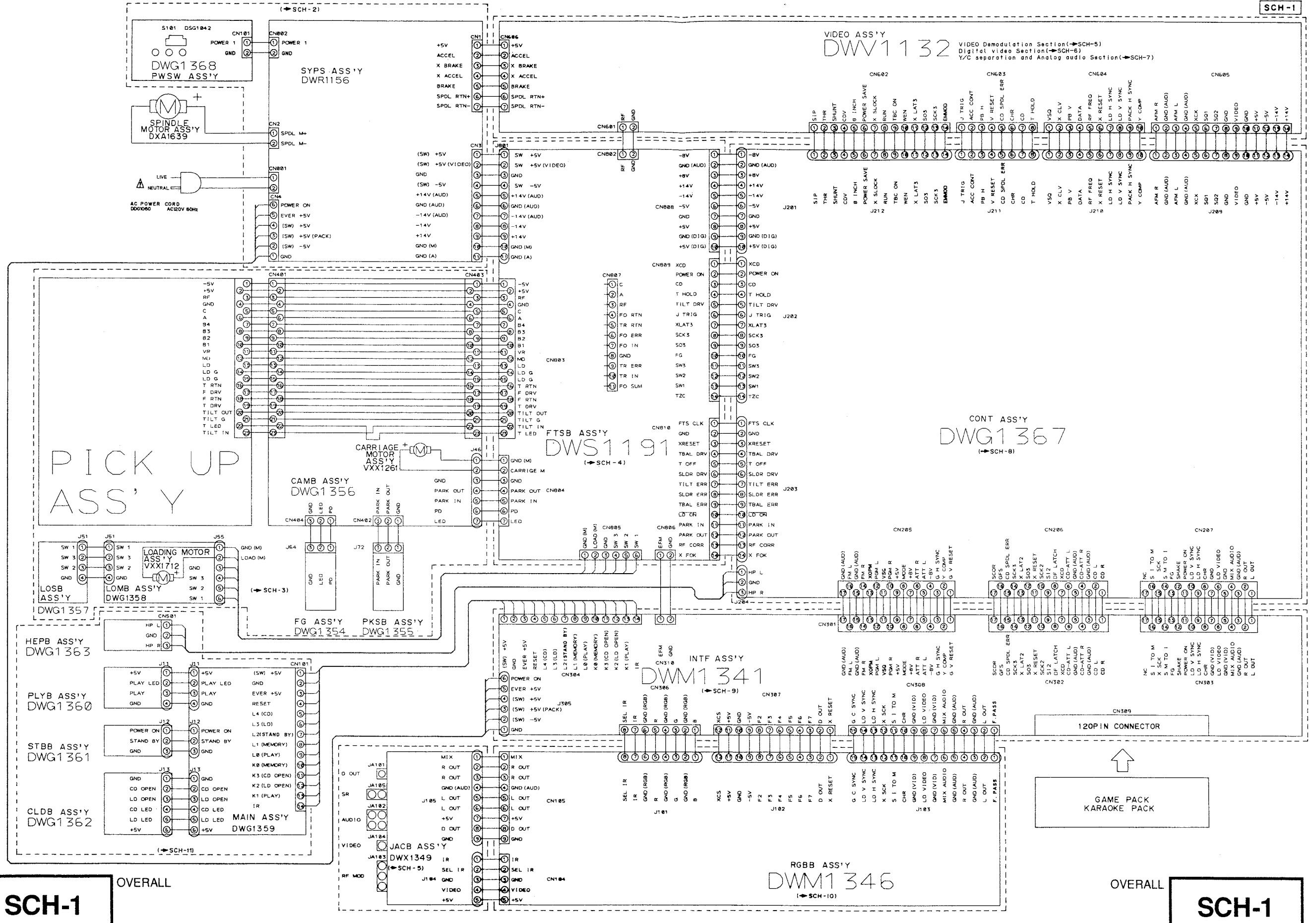
D

A

B

C

D



SCH-1

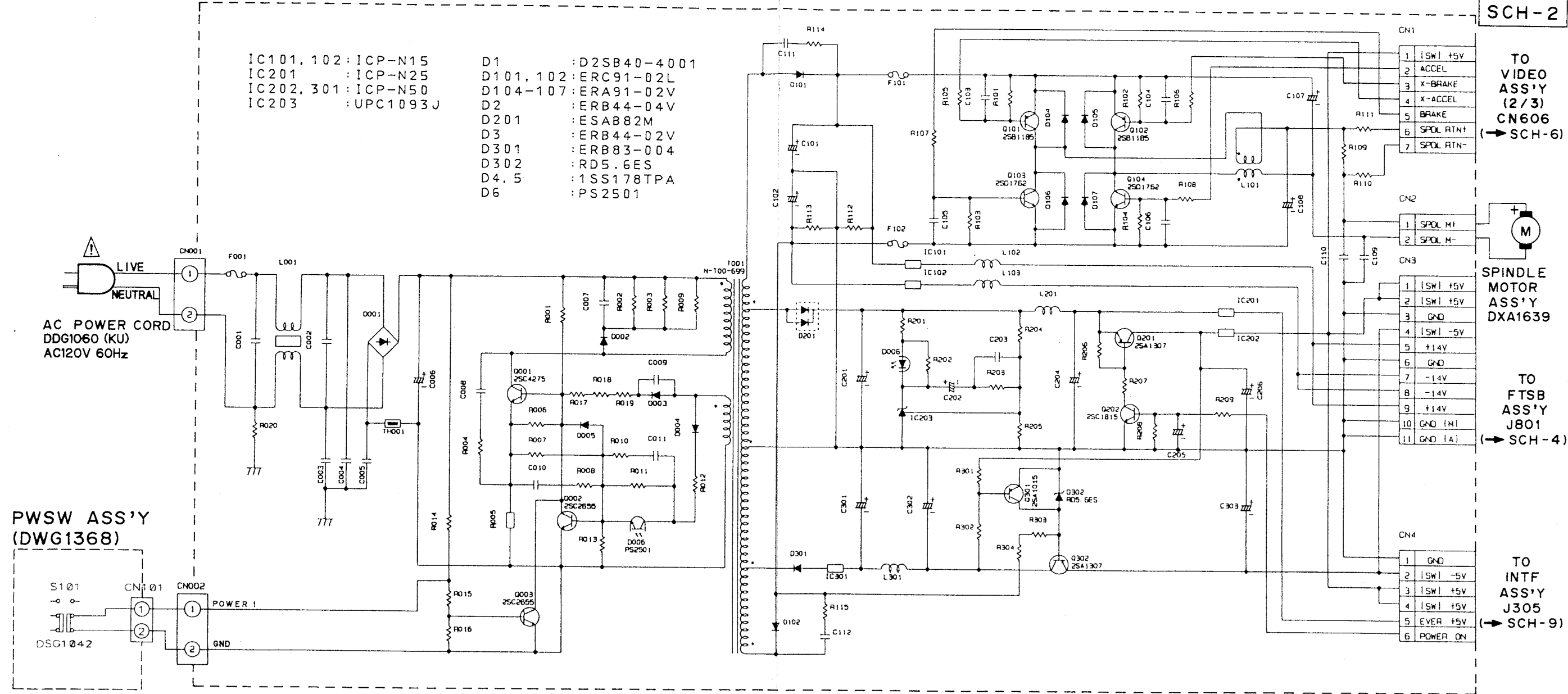
SCH-1

5.2 SYPS, PWSW ASS'Y

CAUTION: FOR CONTINUED PROTECTION AGAINST RISK OF FIRE. REPLACE WITH SAME TYPE NO. ICP-N15, MFD BY ROHM CO., LTD. FOR IC101 AND IC102.

SYPS ASS'Y (DWR1156)

- IC101, 102: ICP-N15
- IC201: ICP-N25
- IC202, 301: ICP-N50
- IC203: UPC1093J
- D1: D2SB40-4001
- D101, 102: ERC91-02L
- D104-107: ERA91-02V
- D2: ERB44-04V
- D201: ESAB82M
- D3: ERB44-02V
- D301: ERB83-004
- D302: RD5.6ES
- D4, 5: 1SS178TPA
- D6: PS2501



CAUTION: FOR CONTINUED PROTECTION AGAINST RISK OF FIRE. REPLACE WITH SAME TYPE NO. ICP-N50, MFD BY ROHM CO., LTD. FOR IC202 AND IC301.

CAUTION: FOR CONTINUED PROTECTION AGAINST RISK OF FIRE. REPLACE WITH SAME TYPE NO. ICP-N25, MFD BY ROHM CO., LTD. FOR IC201.

SCH-2 SYPS ASSY, PWSW ASSY

SYPS ASSY, PWSW ASSY SCH-2

This PCB connection diagram is viewed from the parts mounted side.

This PCB connection diagram is viewed from the foil side.

A

B

C

D

A

B

C

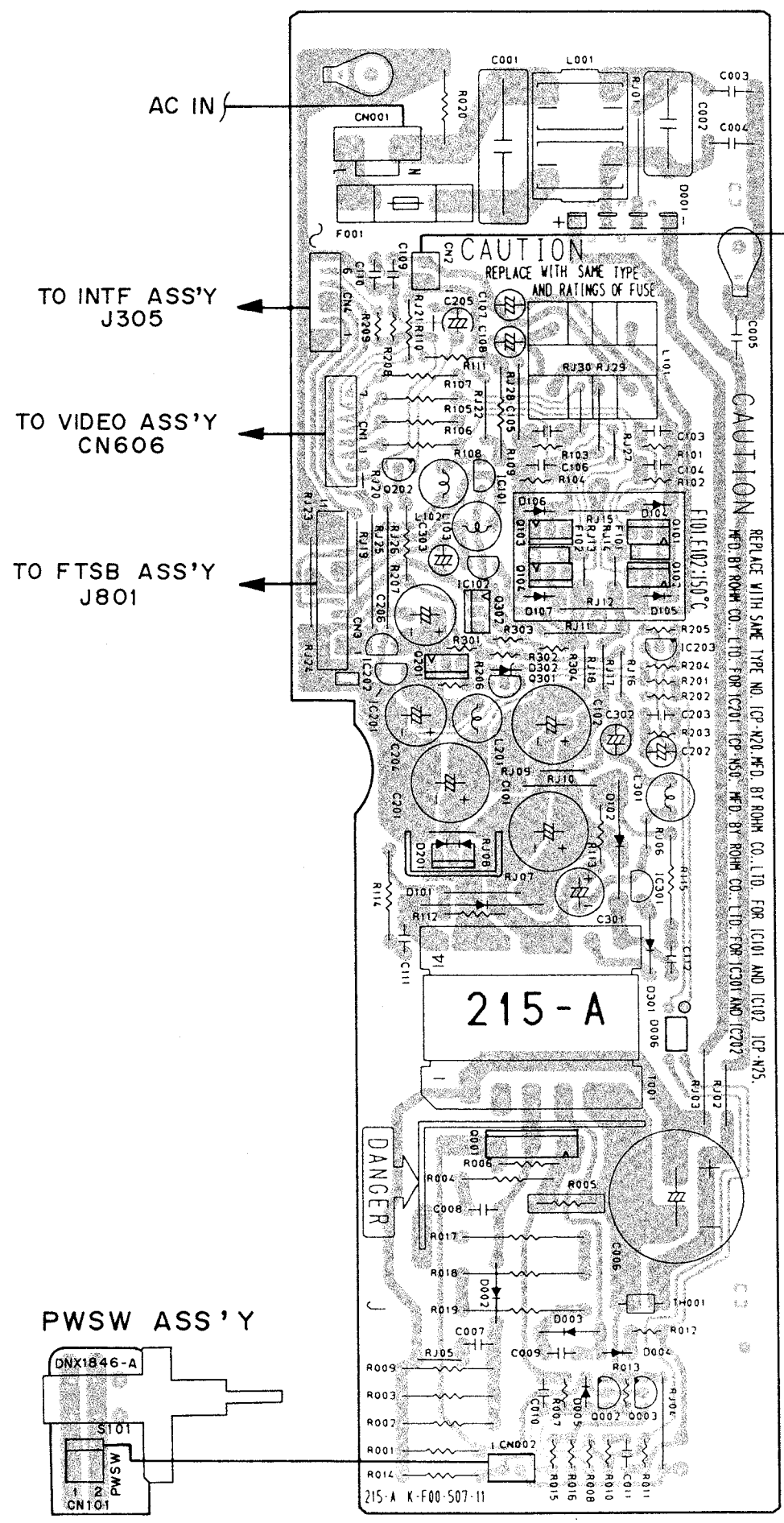
D

SYPS ASS'Y

PCB-1

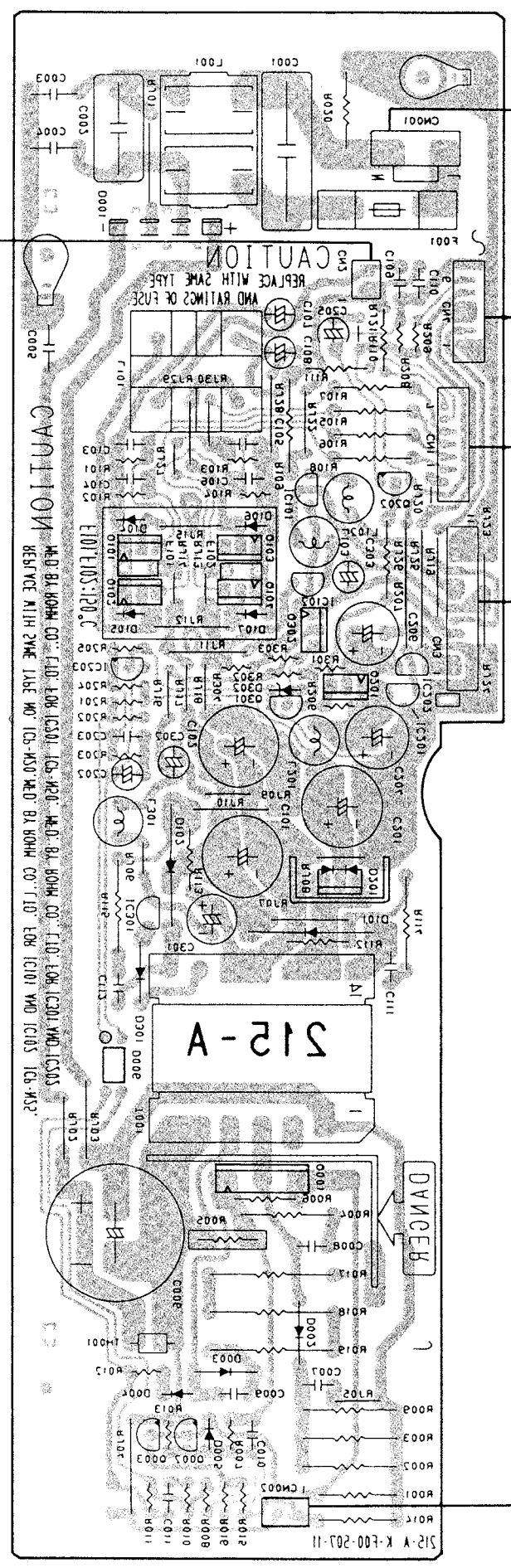
PCB-1

2YPS ASS'Y



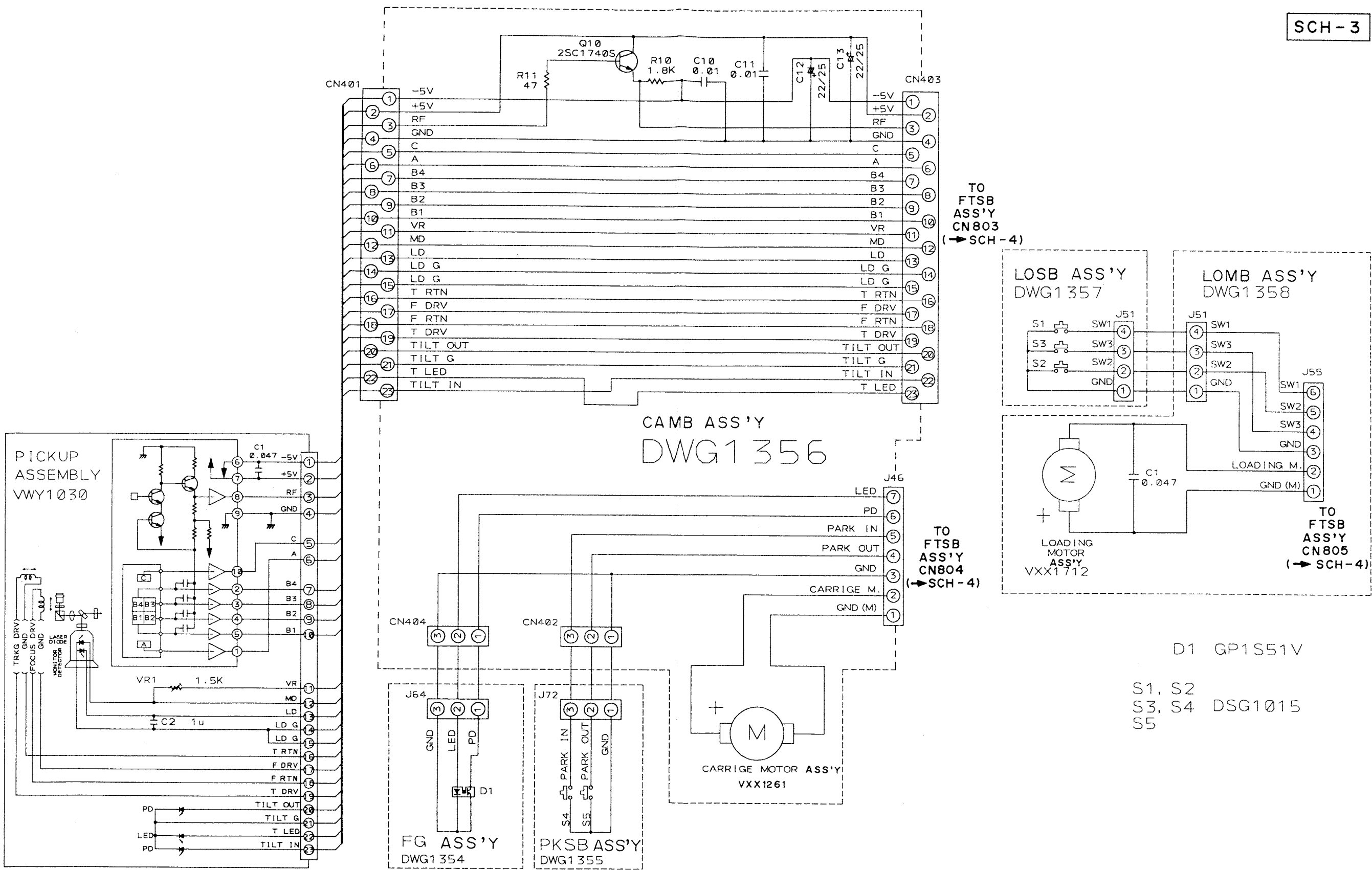
SPINDLE MOTOR ASS'Y

SPINDLE MOTOR ASS'Y



5.3 PICKUP, CAMB, FG, PKSB, LOSB, LOMB ASS'Y

SCH-3



TO FTSB ASS'Y CN803 (SCH-4)

TO FTSB ASS'Y CN804 (SCH-4)

TO FTSB ASS'Y CN805 (SCH-4)

D1 GP1S51V

S1, S2  
S3, S4 DSG1015  
S5

SCH-3

PICKUP ASSY, CAMB ASSY, FG ASSY, PKSB ASSY, LOSB ASSY, LOMB ASSY

PICKUP ASSY, CAMB ASSY, FG ASSY, PKSB ASSY, LOSB ASSY, LOMB ASSY

SCH-3



This PCB connection diagram is viewed from the parts mounted side.

PCB-2

PCB-5

This PCB connection diagram is viewed from the foil side.

A

B

C

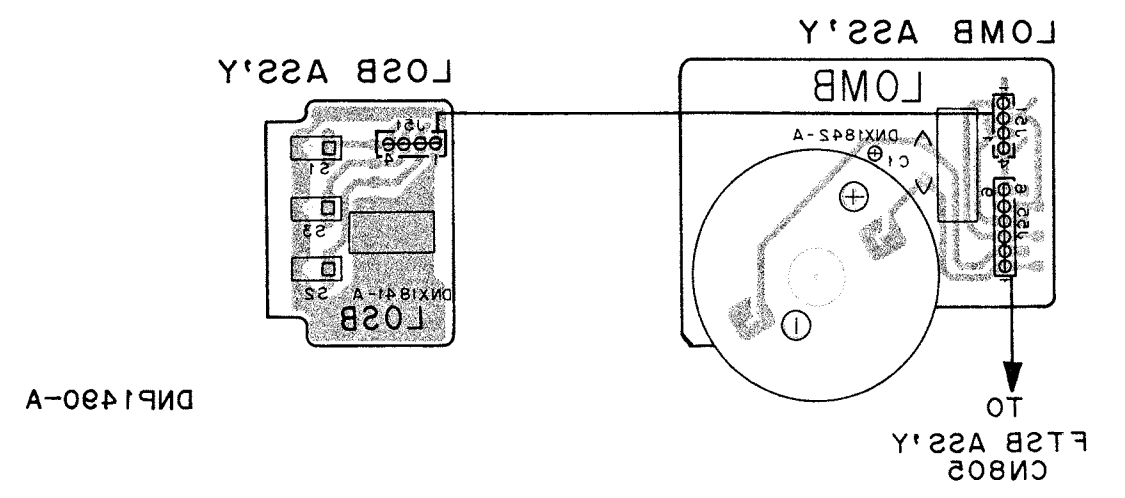
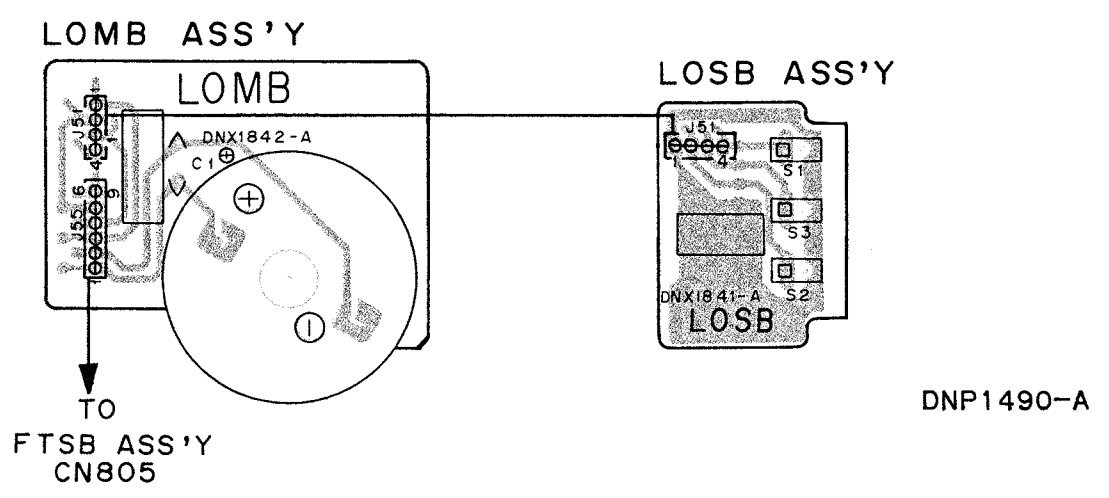
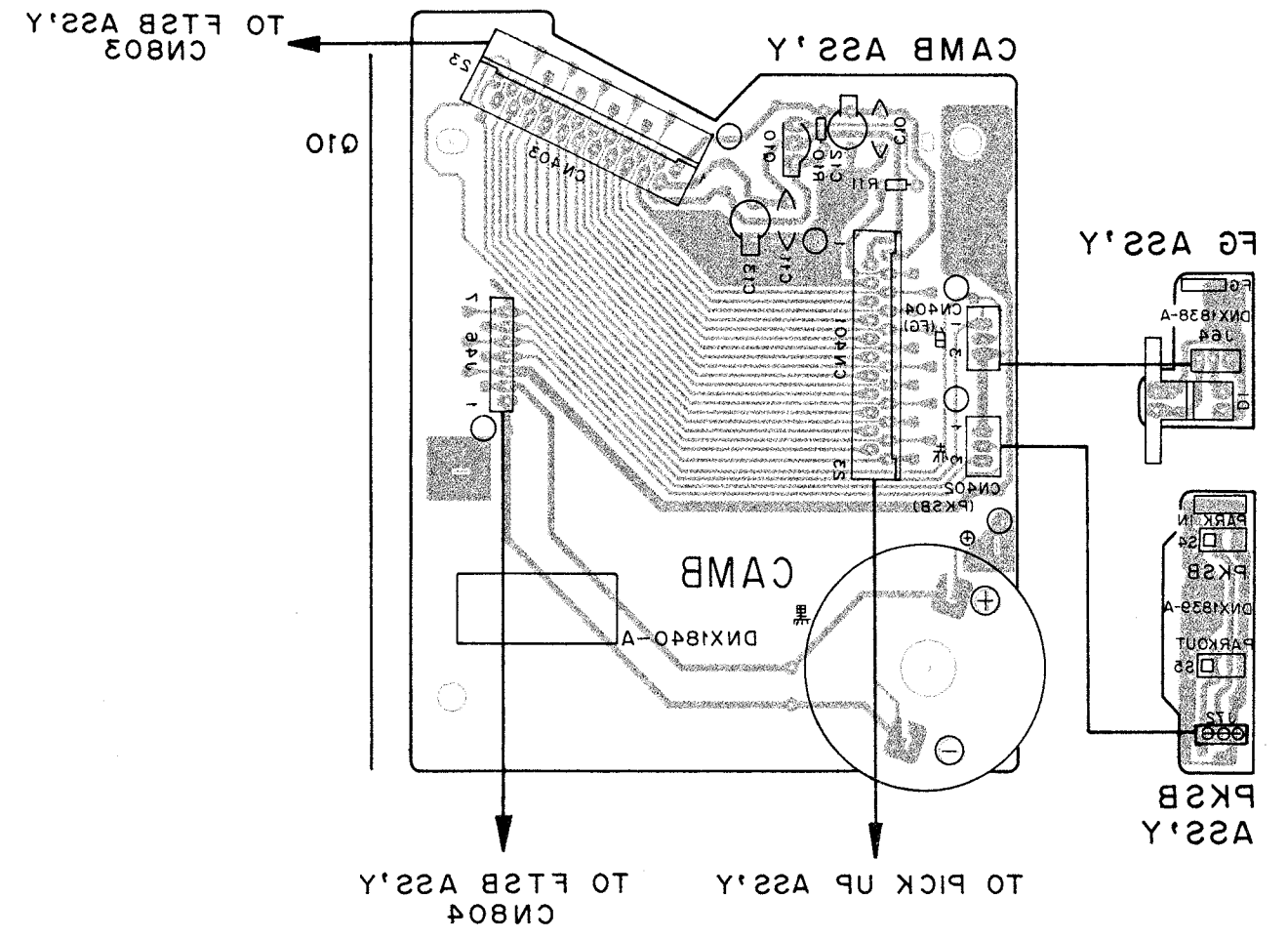
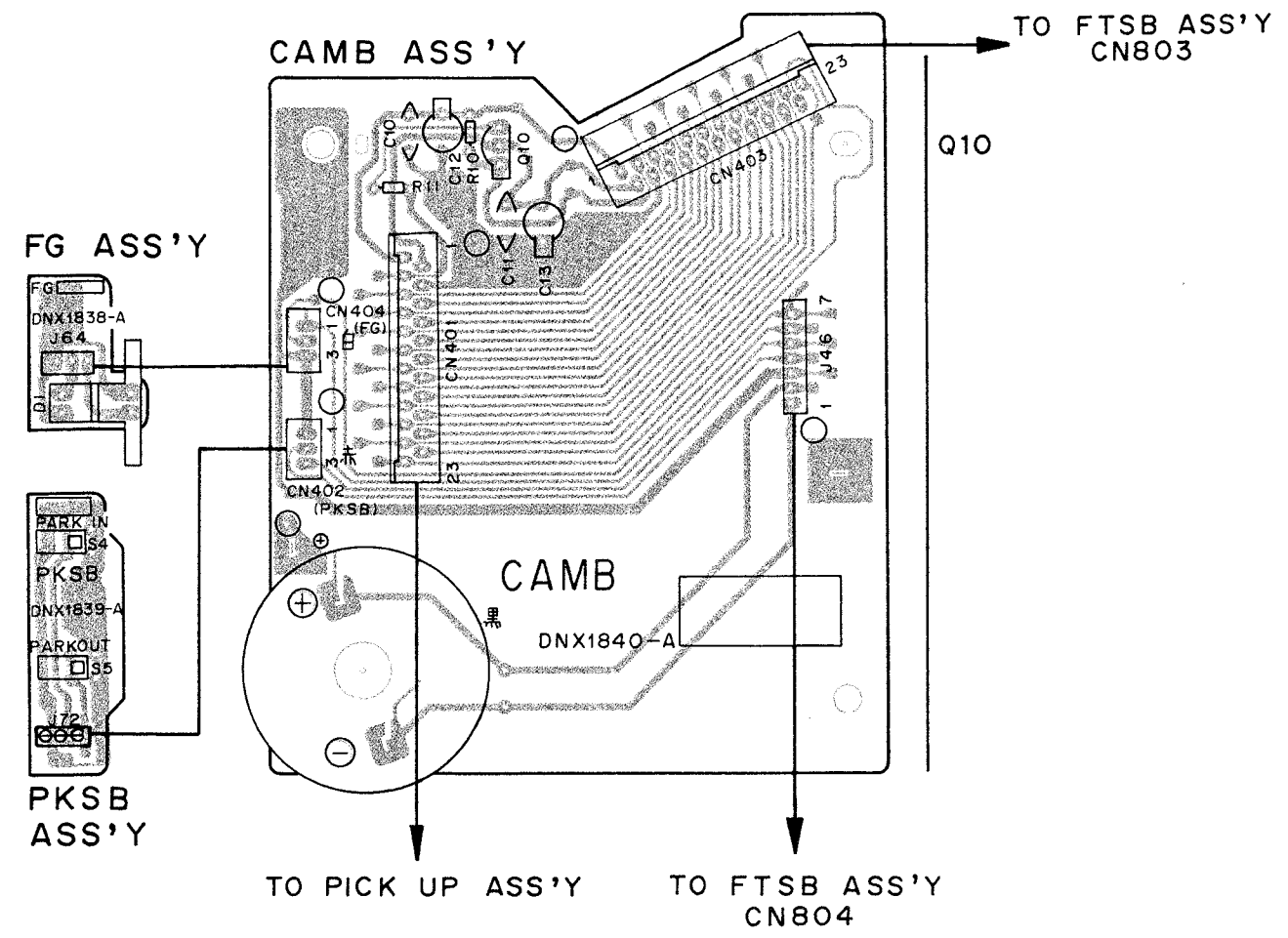
D

A

B

C

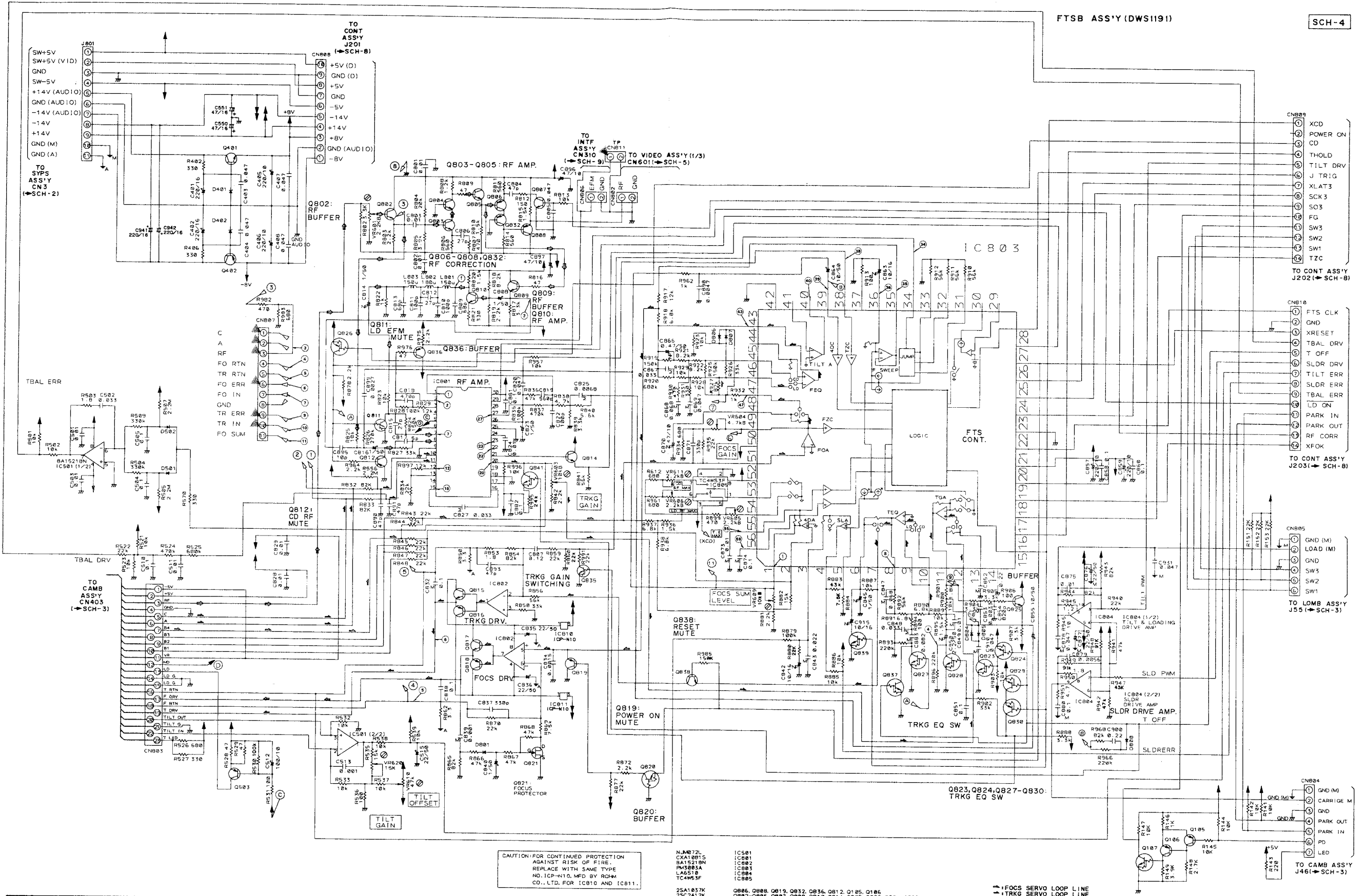
D



5.4 FTSB ASS'Y

FTSB ASS'Y (DWS1191)

SCH-4



CAUTION: FOR CONTINUED PROTECTION AGAINST RISK OF FIRE, REPLACE WITH SAME TYPE NO. ICP-N10, MFD BY RCHM CO., LTD. FOR IC810 AND IC811.

- NJM072L
- CXA1801S
- BA1521BN
- PM5005A
- LA5519
- TC4W53F
- 2SA1837K
- 2SC2412K
- DTA124EK
- OTC124EK
- 2SB1185
- 2SD1762
- 2SA1395
- 2SK184
- Q801, Q804-Q808, Q801, Q802, Q803, Q804, Q805, Q806, Q807, Q808, Q809, Q810, Q811, Q812, Q813, Q814, Q815, Q816, Q817, Q818, Q819, Q820, Q821, Q822, Q823, Q824, Q825, Q826, Q827, Q828, Q829, Q830
- Q801, Q802, Q803, Q804, Q805, Q806, Q807, Q808, Q809, Q810, Q811, Q812, Q813, Q814, Q815, Q816, Q817, Q818, Q819, Q820, Q821, Q822, Q823, Q824, Q825, Q826, Q827, Q828, Q829, Q830
- Q801, Q802, Q803, Q804, Q805, Q806, Q807, Q808, Q809, Q810, Q811, Q812, Q813, Q814, Q815, Q816, Q817, Q818, Q819, Q820, Q821, Q822, Q823, Q824, Q825, Q826, Q827, Q828, Q829, Q830
- Q801, Q802, Q803, Q804, Q805, Q806, Q807, Q808, Q809, Q810, Q811, Q812, Q813, Q814, Q815, Q816, Q817, Q818, Q819, Q820, Q821, Q822, Q823, Q824, Q825, Q826, Q827, Q828, Q829, Q830

FOCUS SERVO LOOP LINE  
TRKG SERVO LOOP LINE  
RF SIGNAL LINE

SCH-4

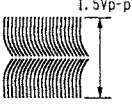
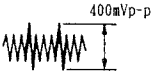
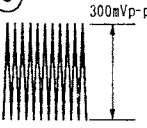
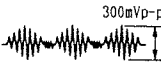



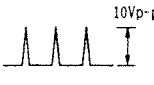
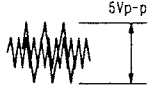
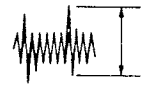



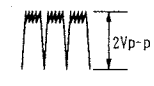

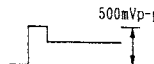

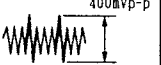
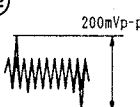

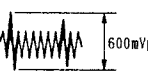

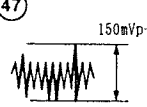

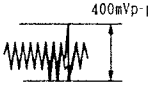
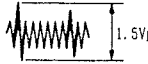



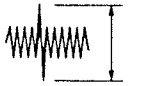
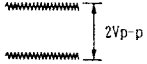
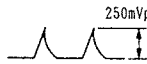
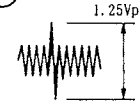
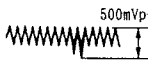
FTSB ASSY

FTSB ASSY

SCH-4

**WAVEFORMS AND VOLTAGE TABLES**  
**FTS SECTION**

Note : (No.) in the table correspond to the pin number.

IC801 (CXA1081S)		CN807	IC803 (PM3003A)		Other points
(1) 	(20) 	(3) 	(1) 	(39) 	(1) Q810 Collector 
(2) 	(22)  : Still	(4) 	(8) 	(40) 	(2) Q809 Emitter 
(7) 	(23) 	(5) 	(34)  : Still	(43) 	(4) Q828 Collector 
(12) 	(27) 	(6) 	(35) 	(47) 	(5) CN803 18Pin 
(15) 		(7) 	(38) 	(55) 	(6) CN803 19Pin 
		(9)  : Open	(38) 	(58) 	
		(10) 			
		(11) 			

This PCB connection diagram is viewed from the parts mounted side.

A

B

C

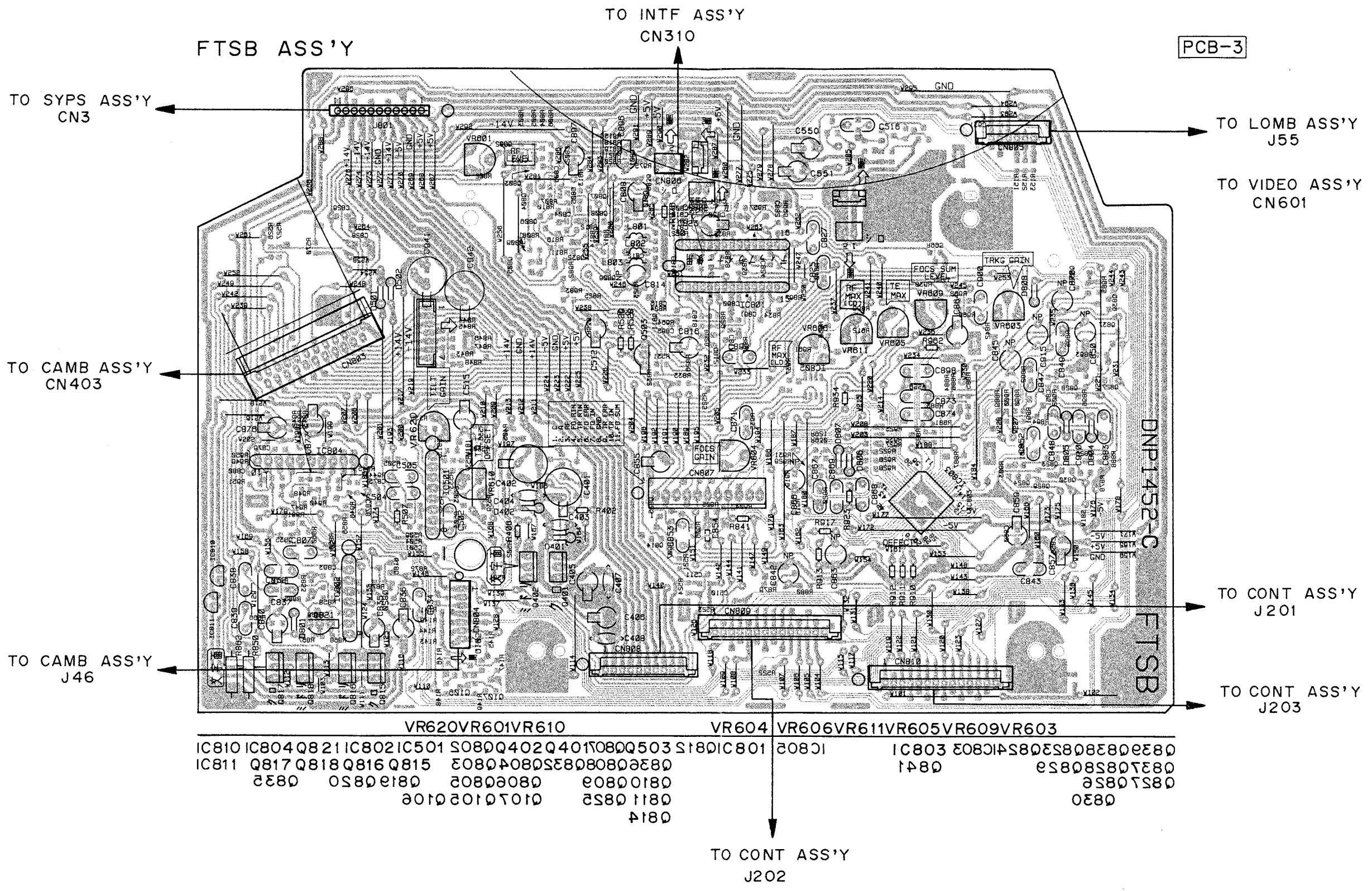
D

A

B

C

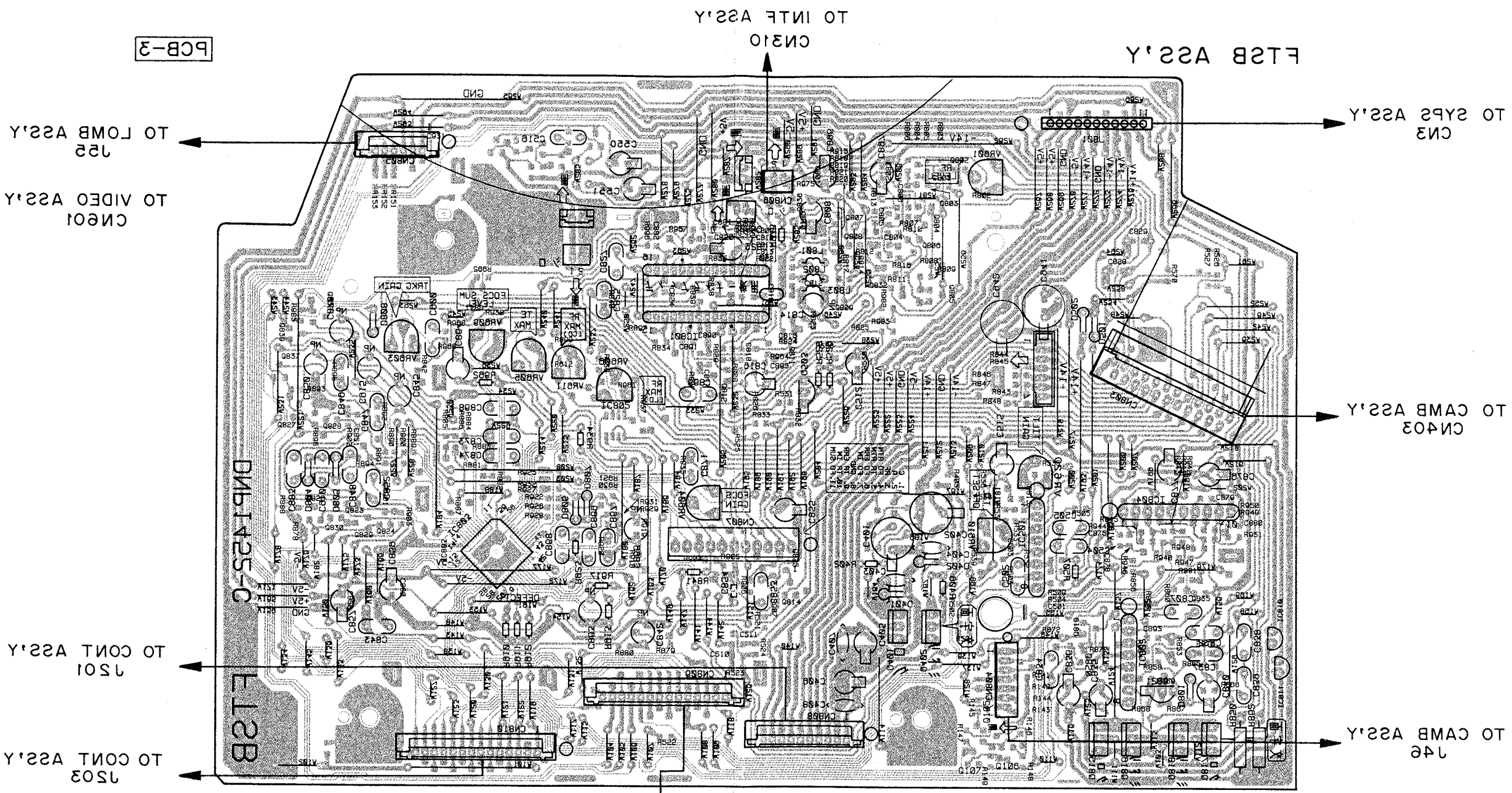
D



IC810	IC804	Q821	IC802	IC501	S080	Q402	Q401	T080	Q503	S180	IC801	IC800	IC803	E080	S180	S280	S380	S480	S580	S680	S780	S880	S980	Q830
IC811	Q817	Q818	Q816	Q815	E080	Q080	S080	S080	S080	S080	S080	S080	Q841	Q841	Q841	Q841	Q841	Q841	Q841	Q841	Q841	Q841	Q841	Q830

This PCB connection diagram is viewed from the foil side.

PCB-3



VRSORVORVRE10		VREOAVRE102VREOAVRE03	
IC810	IC804	IC803	IC801
IC811	Q817	Q829	Q841
Q835	Q819	Q826	
Q835	Q820	Q830	
Q814	Q107		
Q814	Q105		
Q814	Q106		

A

B

C

D

A

B

C

D

- This PCB is double sided.
- Foil pattern for each side is identified with pink and gray. Black colored parts are mounted on the pink foil side; red colored parts on the gray foil side.
- This diagram is viewed from red colored parts side.

PCB-4

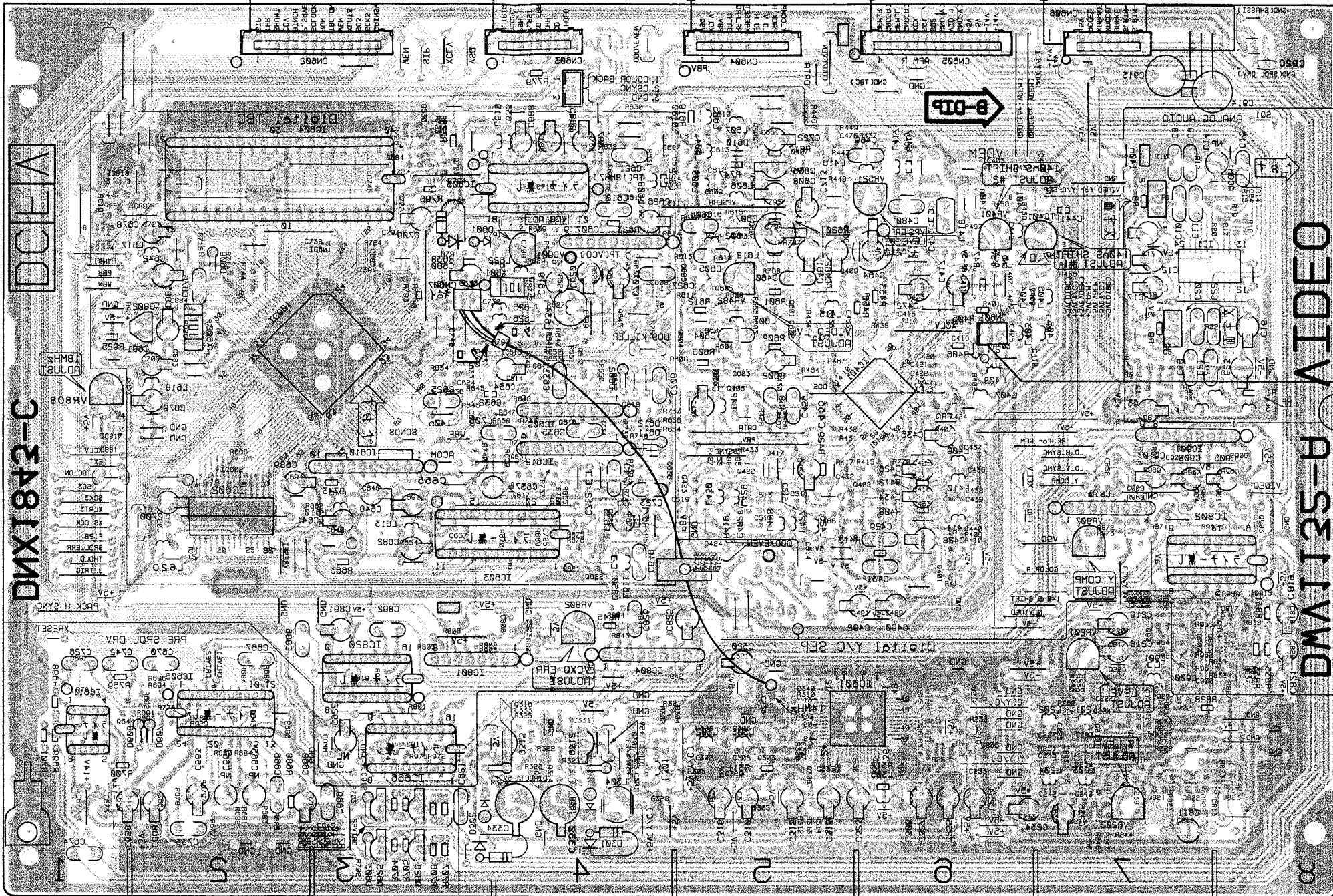
A

B

C

D

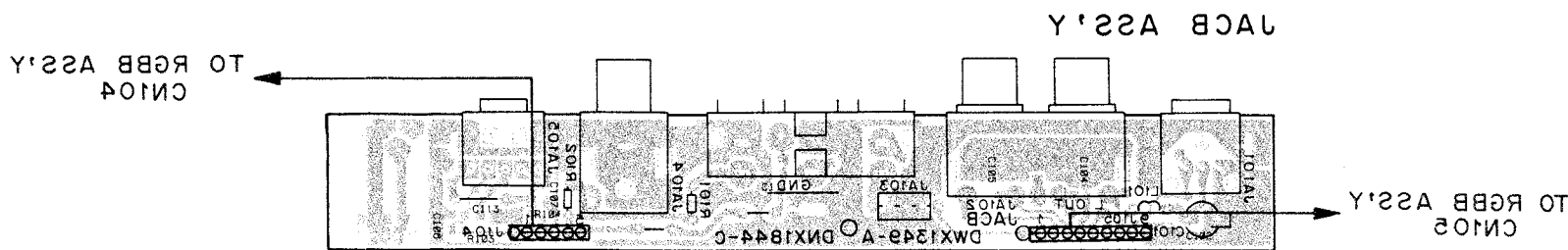
VIDEO ASS'Y TO CONT ASS'Y  
 VIDEO ASS'Y TO CONT ASS'Y  
 VIDEO ASS'Y TO CONT ASS'Y  
 VIDEO ASS'Y TO CONT ASS'Y  
 VIDEO ASS'Y TO CONT ASS'Y



TO FTSB ASS'Y  
 CN805

Q693	Q610	Q609	IC604	Q407	Q033	VR251	IC605	Q702	Q432
Q701	Q408	IC403	Q611	Q608	Q432	IC401	IC607	Q607	Q432
IC1818	Q611	Q608	Q430	Q431	IC101	VR401	IC101	Q430	Q431
	IC1031	Q606	Q606	Q409	IC101	VR401	IC101	Q606	Q409
		IC608	Q605	Q605	VR485	VR485	IC608	Q605	Q605
			Q645	Q601				Q645	Q601
IC613	Q615	Q613	Q603	Q2				Q604	Q602
Q614	Q612	Q406	Q1	IC401				Q604	Q602
			Q618	IC601				Q618	IC601
	IC817	Q616	Q616	IC901				Q616	IC901
	Q631	Q417	Q417	IC601				Q417	IC601
IC602	Q636	Q422	Q422	IC601				Q422	IC601
Q617	Q423	Q402	Q816	IC605				Q402	Q816
	Q619	Q624	Q903	IC815				Q624	Q903
			Q424	IC603				Q424	IC603
			Q811	IC805				Q811	IC805
			Q815	IC805				Q815	IC805
			IC804	IC804				IC804	IC804
			IC801	IC801				IC801	IC801
			IC850	IC850				IC850	IC850
			IC301	IC301				IC301	IC301
Q644	Q643	Q313	Q211	IC606				Q643	Q313
Q301	Q219	Q210	IC611	IC611				Q219	Q210
Q314	Q303	Q216	IC606	IC606				Q303	Q216
IC301	Q317	Q302	Q306	Q217				Q317	Q302
			Q305	Q218					Q305
			Q218	Q218					Q218
			Q218	Q218					Q218
			Q218	Q218					Q218

DMX1421-C



A

B

C

D

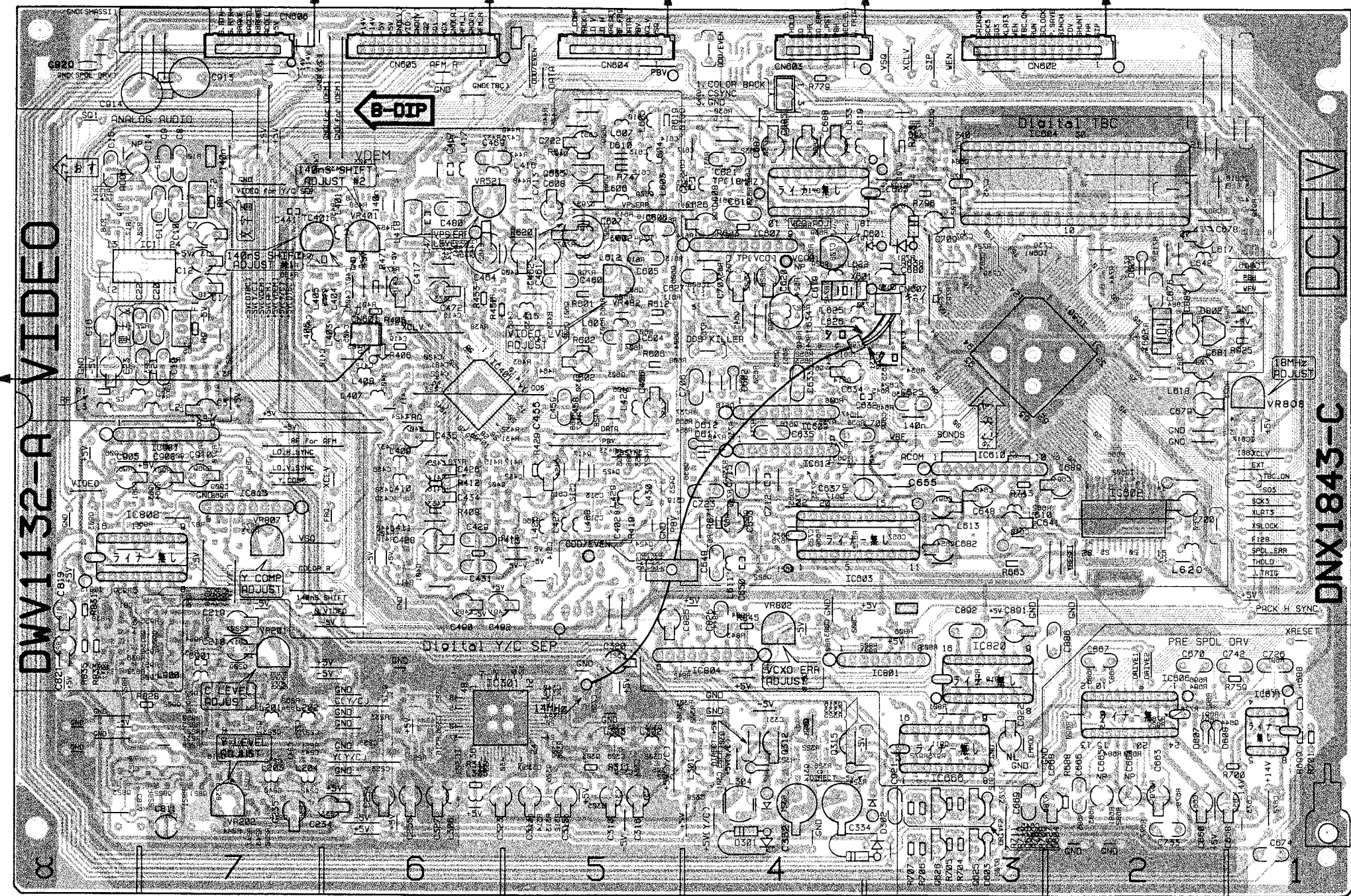
- This PCB is double sided.
- Foil pattern for each side is identified with pink and gray. Black colored parts are mounted on the pink foil side; red colored parts on the gray foil side.
- This diagram is viewed from black colored parts side.

PCB-4

A

A

VIDEO ASS'Y CN1 J209 J210 J211 J212 TO SYPS ASS'Y TO CONT ASS'Y TO CONT ASS'Y TO CONT ASS'Y TO CONT ASS'Y



DWF1132-A

DNX1843-C

VR521	IC605	5070		
TC401	IC607	7020	3070	
VR401	IC1	1431	0340	3180
VC901	0409	0600	1001	1001
VR482	2000	8001		
		1030	2430	
	IC601	5030	4030	
		50	3030	3130
	IC401		10	3040
VR808	IC601	8130		
	IC901	3130	7180	1080
	IC612	7140	0310	
	IC610	5545	3330	0305
	IC602	3180	5040	3340
	IC815	3030	4540	0130
VR807	IC603	4540		
	IC802	1180	1530	
		2180	1040	5530
	IC804	4180	1030	
VR201	IC801	3180	0030	
	IC820	0050	7180	8180
	IC301	5030	5150	3130
	IC606	1150	3130	3430
	IC611	Q312	0150	0150
	IC666	Q315	3130	3030
		7150	3030	3150
VR202	Q628	3030		
	Q627	8150		
	Q626			
	Q625			

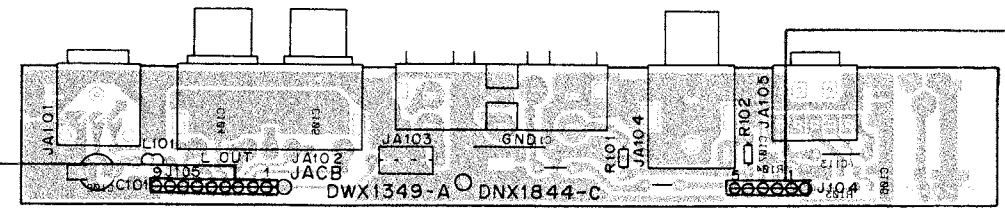
B

C

3

TO FTSS ASS'Y CN802

JACB ASS'Y



TO RGBB ASS'Y CN104

TO RGBB ASS'Y CN105

D





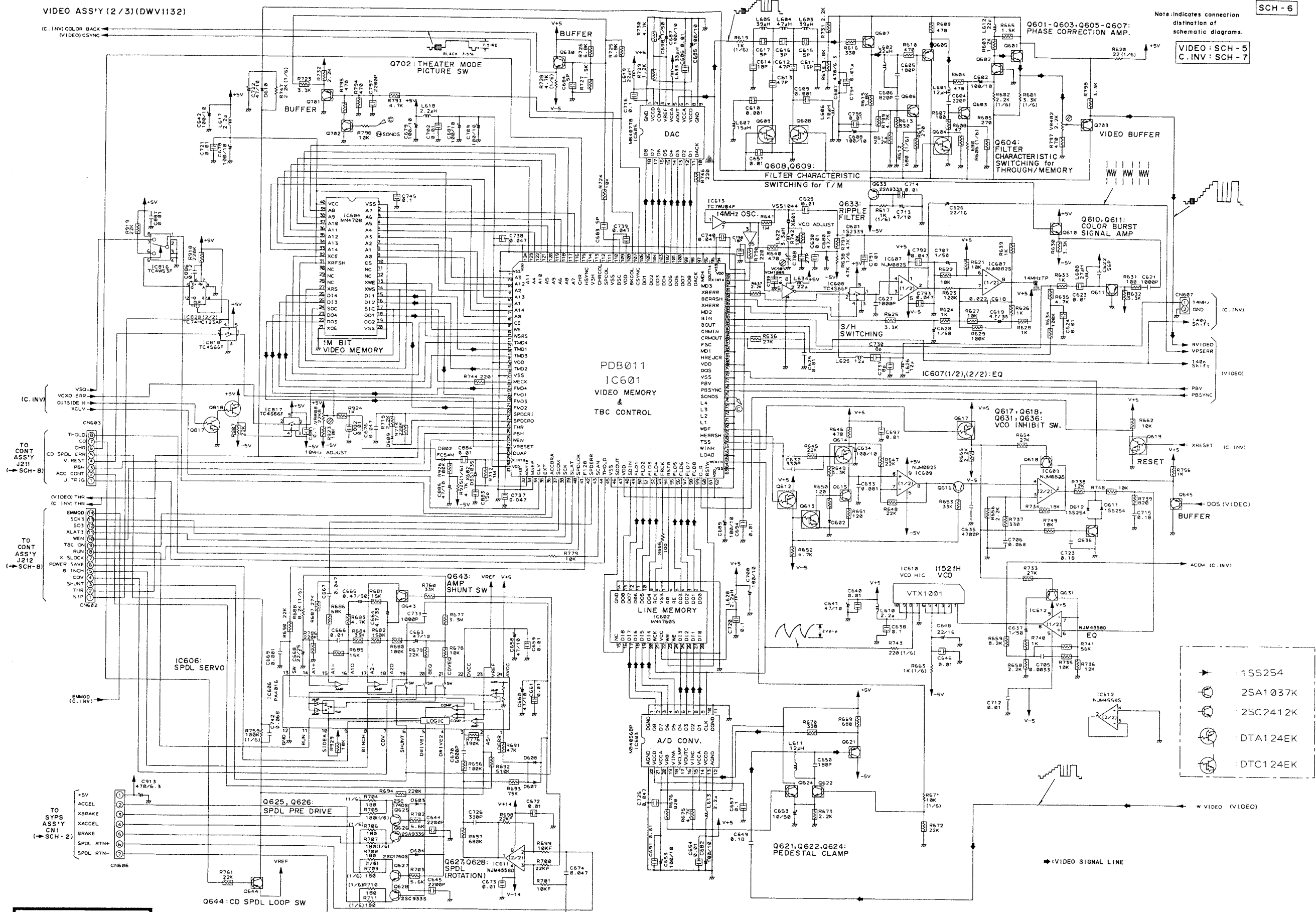
5.6 VIDEO ASS'Y (2/3) (DIGITAL VIDEO)

SCH-6

VIDEO ASS'Y (2/3) (DWV1132)

Note: indicates connection  
distinction of  
schematic diagrams.

VIDEO : SCH-5  
C. INV : SCH-7



- ▶ 1SS254
- 2SA1037K
- 2SC2412K
- DTA124EK
- DTC124EK

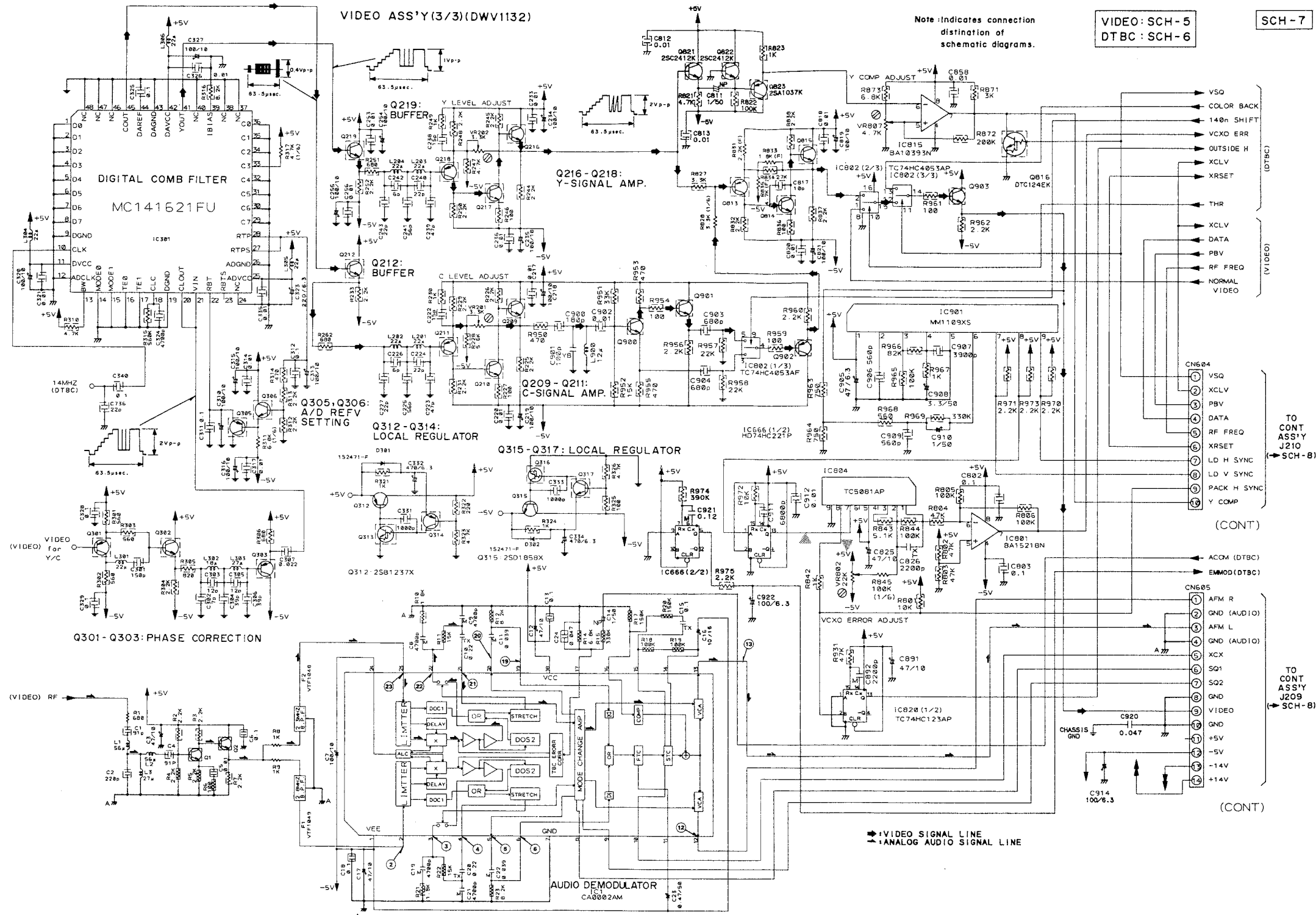
SCH-6

VIDEO ASSY (2/3)

VIDEO ASSY (2/3)

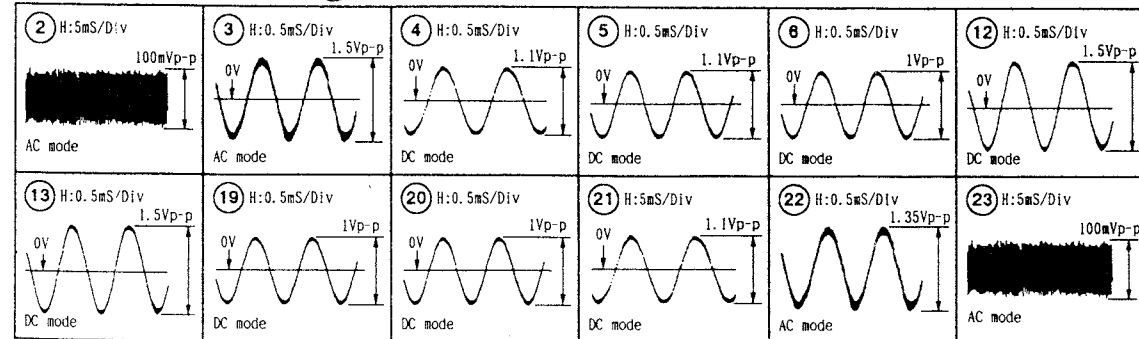
SCH-6

5.7 VIDEO ASS'Y (3/3) (Y/C SEPARATION AND ANALOG AUDIO)



Note: These waveforms are at the PLAY mode.

● IC1 (CA0002AM) Note: (No.) in the table correspond to the pin number.



● IC1 (CA0002AM)

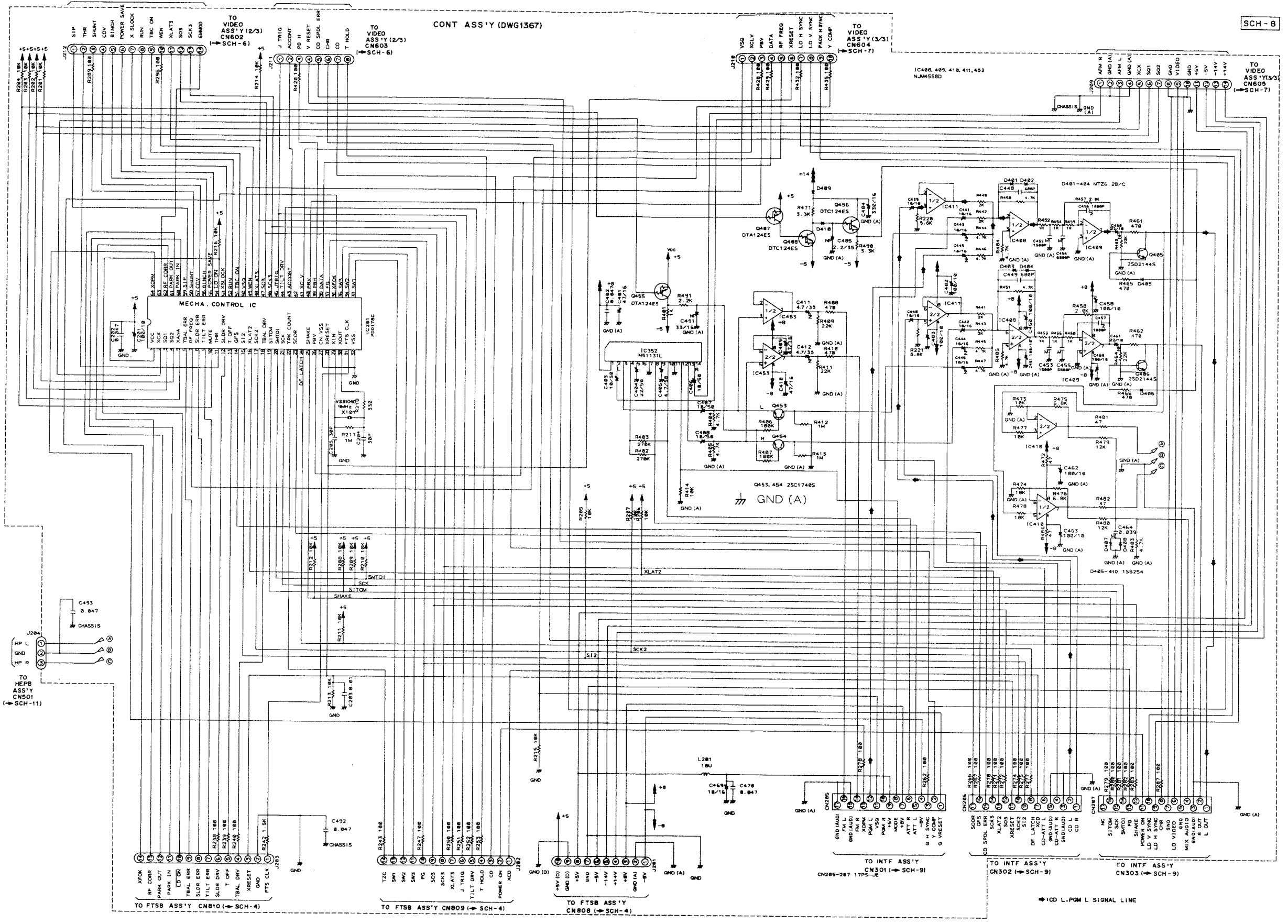
Pin No.	Voltage [V]	Pin No.	Voltage [V]
1	-5	13	*
2	*	14	-0.6
3	*	15	-0.6
4	*	16	0
5	*	17	0
6	*	18	5
7	0	19	*
8	0	20	*
9	0	21	*
10	5	22	*
11	2	23	*
12	*	24	-2.2

\* : Refer to waveforms

SCH-7 VIDEO ASSY (3/3)

VIDEO ASSY (3/3) SCH-7

5.8 CONT ASS'Y (CONTROL)



SCH-8

CONT ASSY

CONT ASSY

SCH-8

CONT ASS'Y

A

B

C

D

TO  
FTSB  
ASS'Y  
CN810

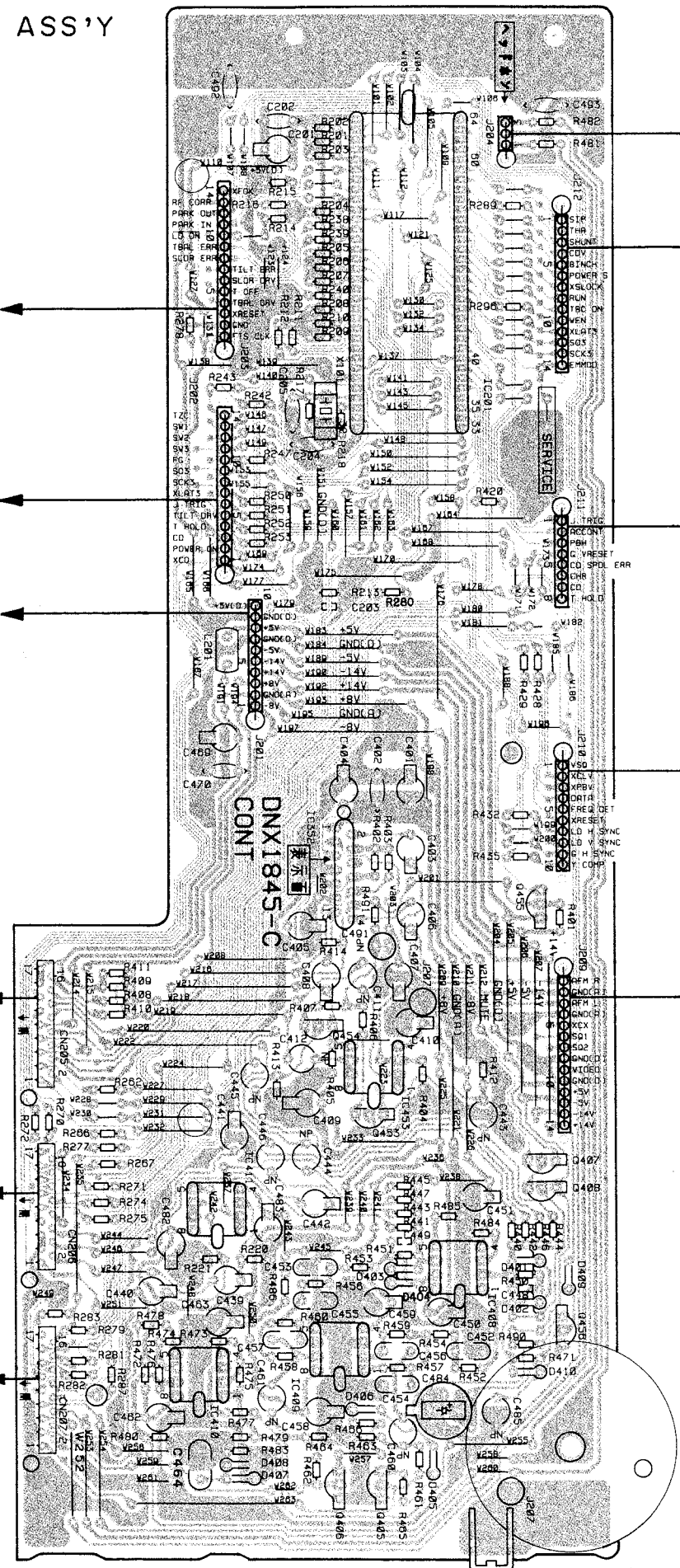
TO  
FTSB  
ASS'Y  
CN809

TO  
FTSB  
ASS'Y  
CN808

TO  
INTF  
ASS'Y  
CN301

TO  
INTF  
ASS'Y  
CN302

TO  
INTF  
ASS'Y  
CN303



PCB-5

TO  
HEPB  
ASS'Y  
CN501

TO  
VIDEO  
ASS'Y  
CN602

TO  
VIDEO  
ASS'Y  
CN603

TO  
VIDEO  
ASS'Y  
CN604

TO  
VIDEO  
ASS'Y  
CN605

IC 201

IC 352

Q 455

Q 454

IC 453

Q 453

Q 407

Q 408

IC 411

IC 408

Q 456

IC 409

IC 410

Q 405

Q 406

PCB-2

TO  
HEPB  
ASS'Y  
CN501

TO  
VIDEO  
ASS'Y  
CN602

TO  
VIDEO  
ASS'Y  
CN603

TO  
VIDEO  
ASS'Y  
CN604

TO  
VIDEO  
ASS'Y  
CN605

IC 501

IC 355

Q 452

Q 454

IC 453

Q 453

Q 407

Q 408

IC 411

IC 408

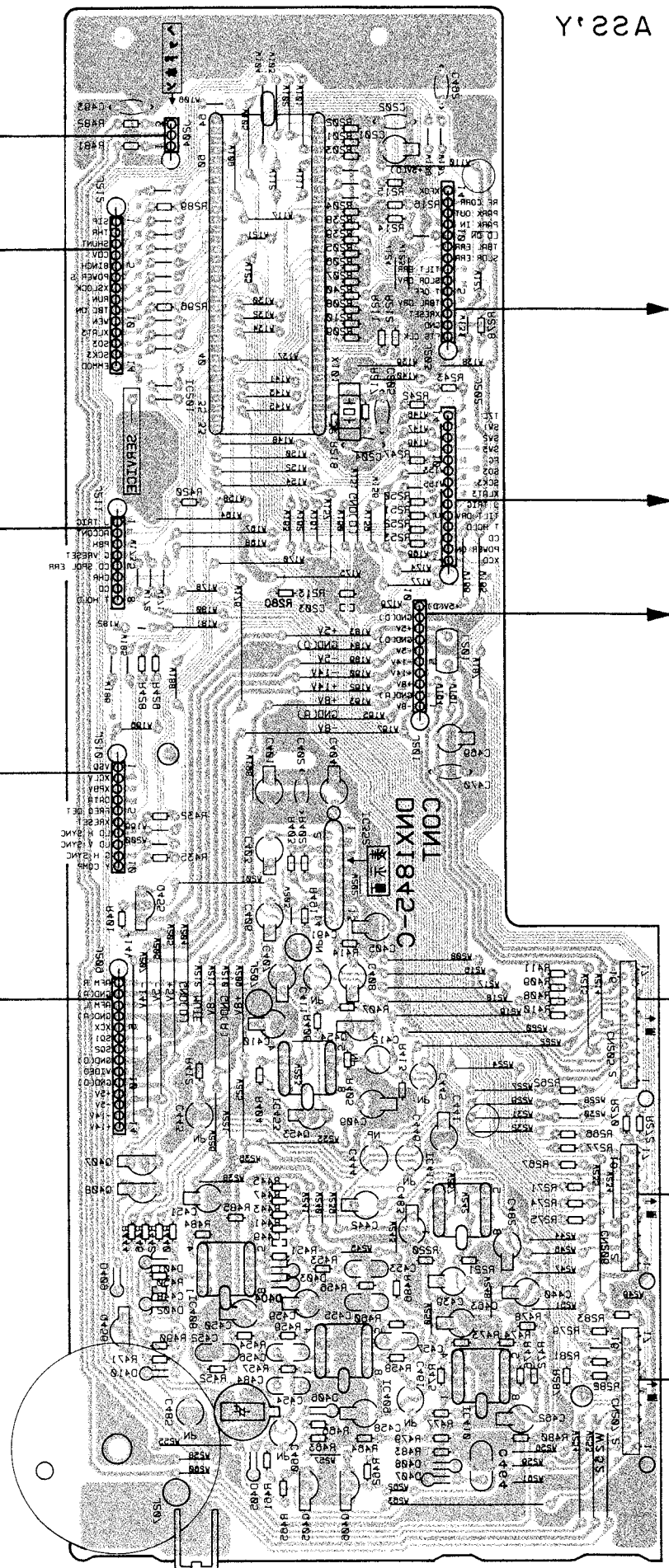
Q 456

IC 409

IC 410

Q 405

Q 406



CONT ASS'Y

A

B

C

D

TO  
FTSB  
ASS'Y  
CN810

TO  
FTSB  
ASS'Y  
CN809

TO  
FTSB  
ASS'Y  
CN808

TO  
INTF  
ASS'Y  
CN301

TO  
INTF  
ASS'Y  
CN302

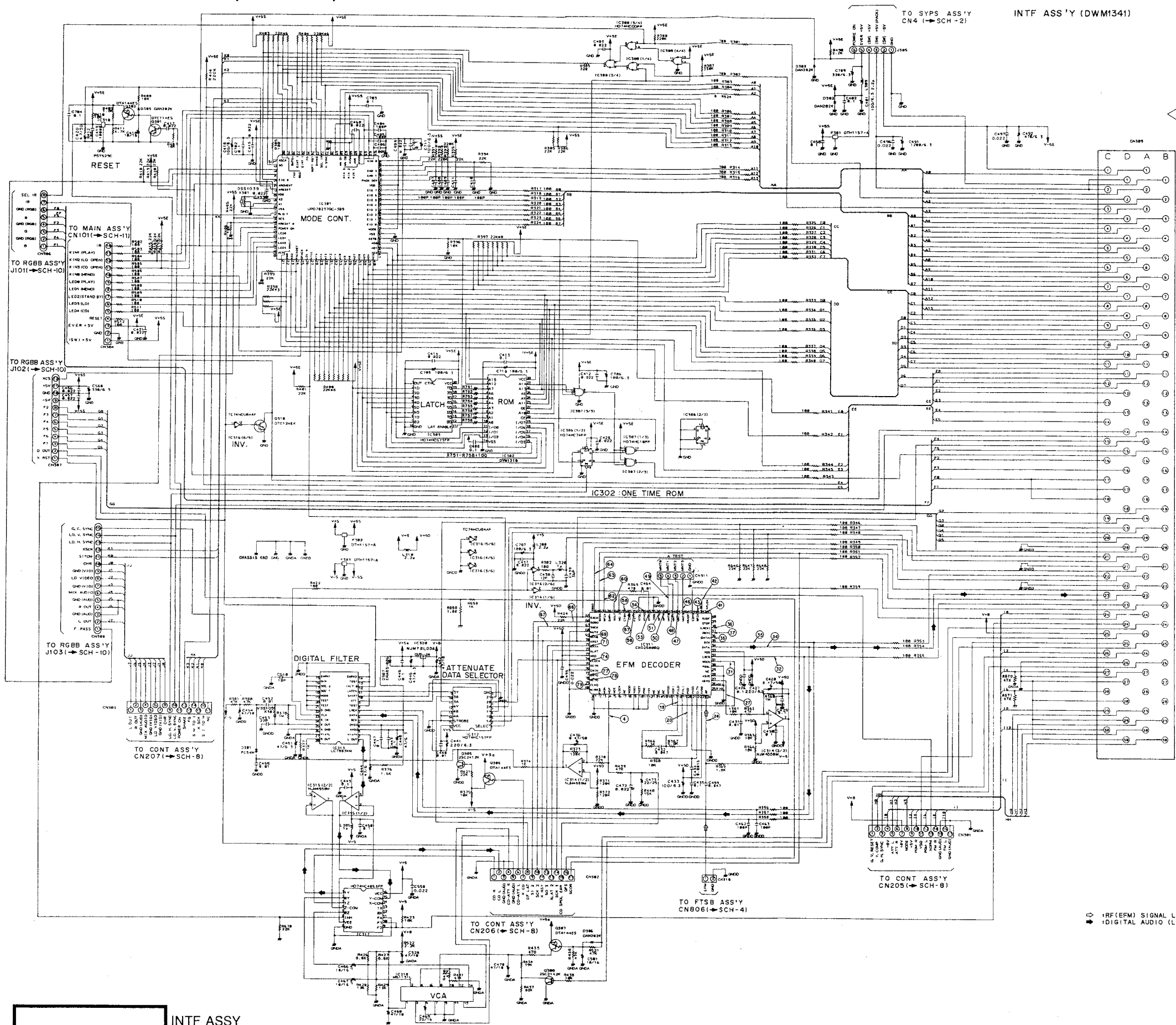
TO  
INTF  
ASS'Y  
CN303

This PCB connection diagram is viewed from the parts mounted side. DNP1488-C

DNP1488-C This PCB connection diagram is viewed from the foil side.

5.9 INTF ASS'Y (INTERFACE)

SCH-9



GAME PACK  
KARAOKE PACK

	C	D	A	B
1	(SW) -5V	(SW) +5V	EIO 8	GND (D)
2	(SW) +5V	SEL IR IN	S OUT	X SCK
3	SEL IR OUT	EIO 7	TXD	EINT 2
4	EIO 6	EIO 5	S IN	RXD
5	EIO 4	EIO 3	EINT 1	V SYNC
6	EIO 2	EIO 1	EDA 1	EDA 0
7	EIO 0	AD 0	EAD 2	EAD 1
8	AD 1	AD 2	PACK DEF	A8
9	AD 3	AD 4	A9	A10
10	AD 5	AD 6	A11	A12
11	AD 7	ASTB	A13	A14
12	X WAIT	XRD	A15	EXO 3
13	XWR	RESET IN	EXO 2	EXO 1
14	RESET OUT	LD H SYNC	NC	LD V SYNC
15	GND (RGB)	R	X RST	ROMCS
16	GND (RGB)	G	NC	NC
17	GND (RGB)	B	NC	NC
18	GND (RGB)	F0	NC	F4
19	F1	F2	F5	F6
20	F3	GND (D)	F7	LATCH
21	MT CLK	GND (D)	SHIFT	ATT
22	BCK	GND (D)	EXCK	SBSO
23	DATA	LRCK	SCOR	WECK
24	-BV	CD SW	C2PO	CD FADE
25	+BV	VSQ	CD SMT	G. C. SYNC
26	+5V	GND (AUD)	G. V. RESET	G. H. SYNC
27	PGM R	GND (AUD)	GND (AUD)	NC
28	PGM L	GND (AUD)	NC	NC
29	FM R	GND (AUD)	Y. COMP	ATT L
30	FM L	GND (AUD)	ATT R	MODE

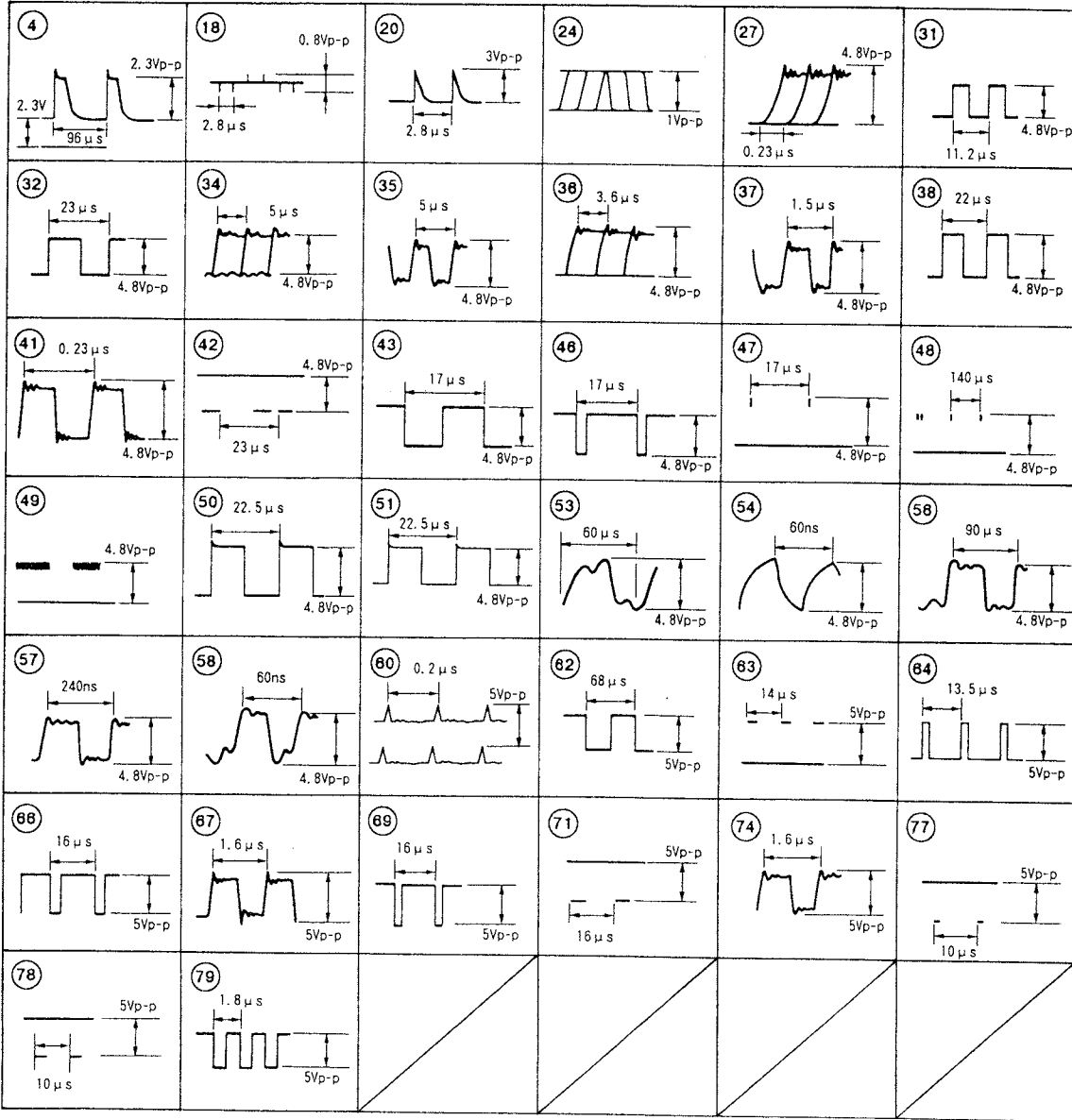
— +RF (EFM) SIGNAL LINE  
- - - DIGITAL AUDIO (L) SIGNAL LINE

SCH-9 INTF ASSY

INTF ASSY SCH-9

IC311 (CXD2500BQ)

Note: (No.) in the table correspond to the pin number.



Note : These voltages are at the PLAY mode.

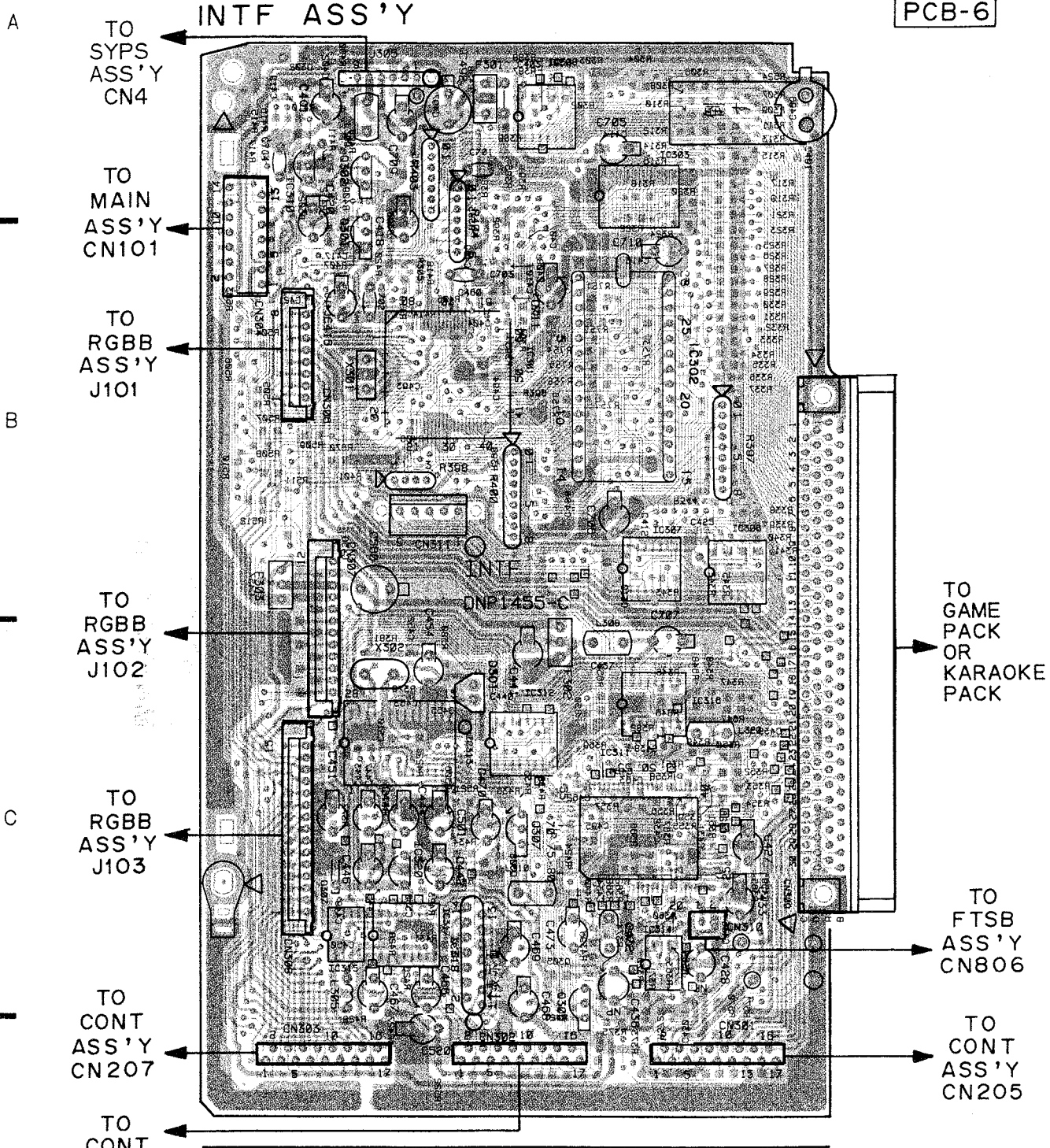
IC311 (CXD2500BQ)

Pin No.	Voltage [V]	Pin No.	Voltage [V]	Pin No.	Voltage [V]	Pin No.	Voltage [V]	Pin No.	Voltage [V]	Pin No.	Voltage [V]
1	0	15	0	29	0	43	*	57	*	71	*
2	0	16	4.8	30	0	44	0	58	*	72	5
3	0	17	0	31	*	45	4.8	59	5	73	5
4	*	18	*	32	*	46	*	60	*	74	*
5	0	19	2.4	33	4.8	47	*	61	5	75	0
6	4.8	20	*	34	*	48	*	62	*	76	0
7	0	21	0	35	*	49	*	63	*	77	*
8	4.8	22	2.3	36	*	50	*	64	*	78	*
9	0	23	4.8	37	*	51	*	65	0	79	*
10	0	24	*	38	*	52	0	66	*	80	0
11	0	25	0	39	0	53	*	67	*		
12	0	26	0	40	4.8	54	*	68	0		
13	0	27	*	41	*	55	0	69	*		
14	0	28	0	42	*	56	*	70	5		

\* : Refer to waveforms

- This PCB is double sided.
- Foil pattern for each side is identified with pink and gray. Black colored parts are mounted on the pink foil side; red colored parts on the gray foil side.
- This diagram is viewed from black colored parts side.

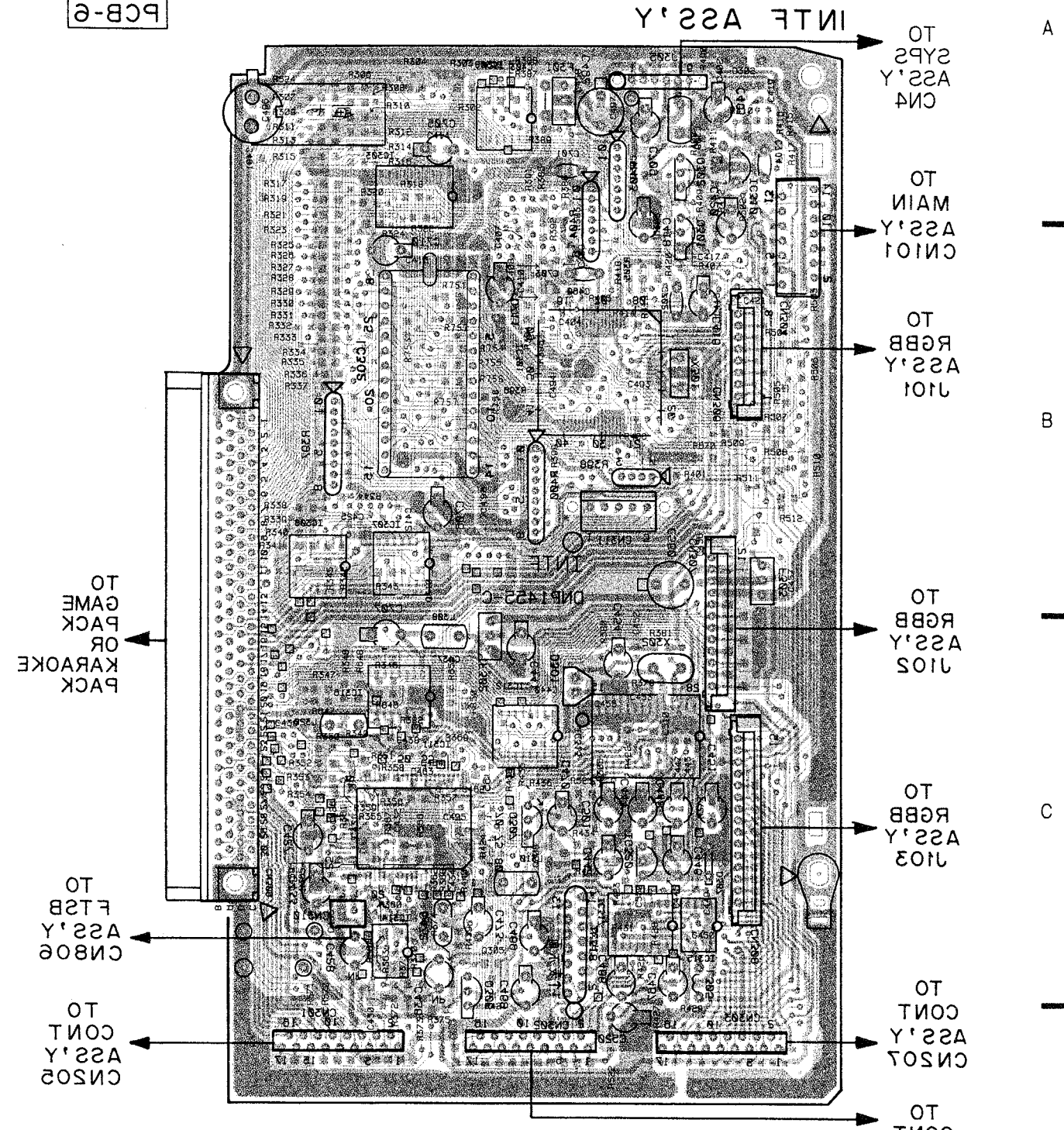
PCB-6



Q302 IC313 IC301 IC308 IC303 IC306  
 Q301 IC317 Q307 IC312 IC307 IC311  
 IC310 IC320 IC318 Q306 IC316  
 IC315 80E0 20E0 IC314  
 01E0  
 IC302

- This PCB is double sided.
- Foil pattern for each side is identified with pink and gray. Black colored parts are mounted on the pink foil side; red colored parts on the gray foil side.
- This diagram is viewed from red colored parts side.

PCB-6

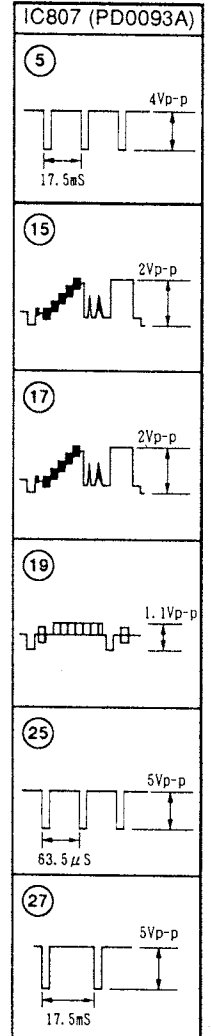
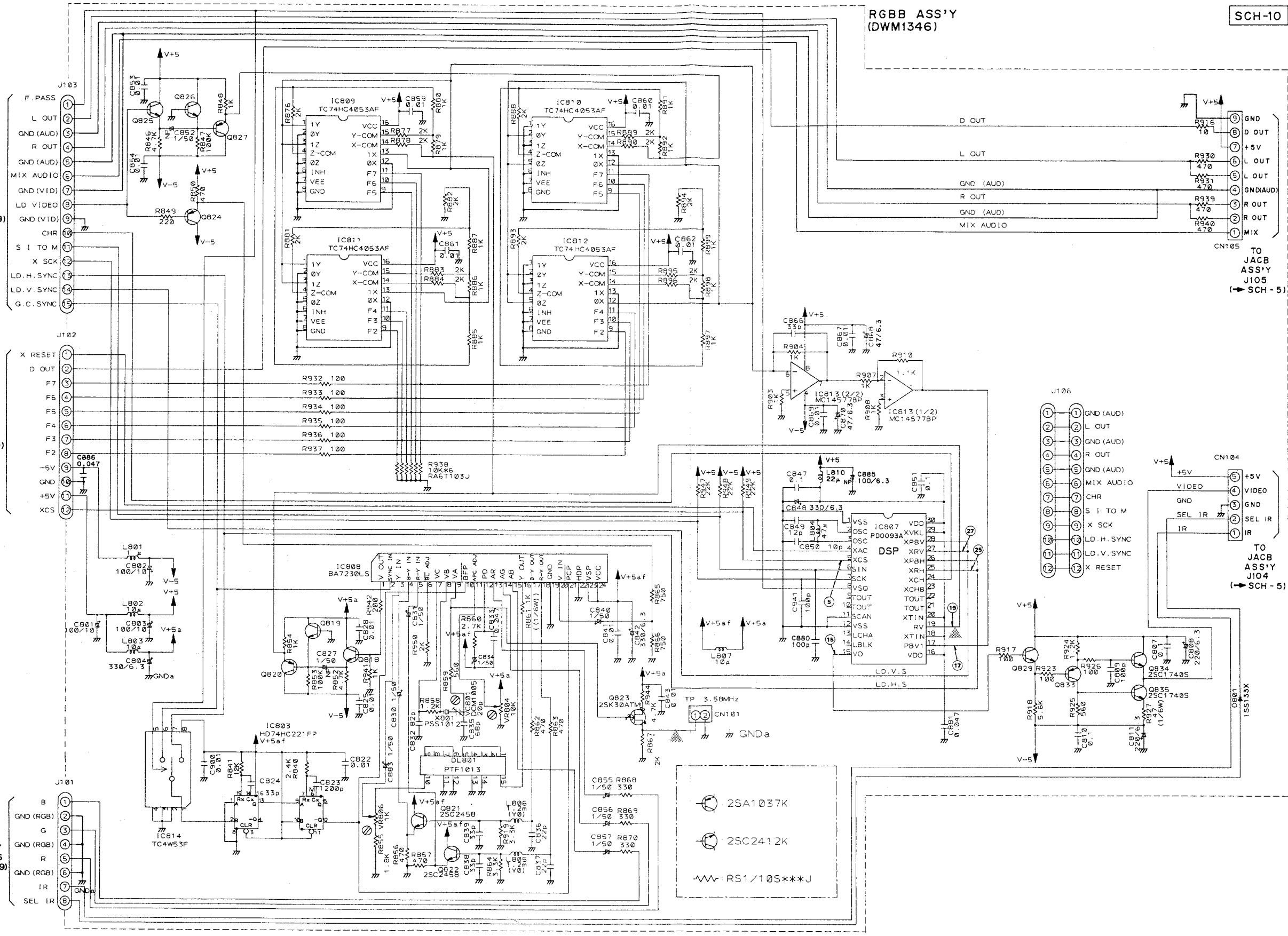


Q305 IC313 IC301 IC308 IC303 IC306  
 Q301 IC317 Q307 IC312 IC307 IC311  
 IC310 IC320 IC318 Q306 IC316  
 IC315 80E0 20E0 IC314  
 01E0  
 IC302

5.10 RGBB ASS'Y

RGBB ASS'Y (DWM1346)

SCH-10



SCH-10 RGBB ASSY

RGBB ASSY SCH-10



This PCB connection diagram is viewed from the parts mounted side.

This PCB connection diagram is viewed from the foil side.

PCB-7

PCB-7

A

B

C

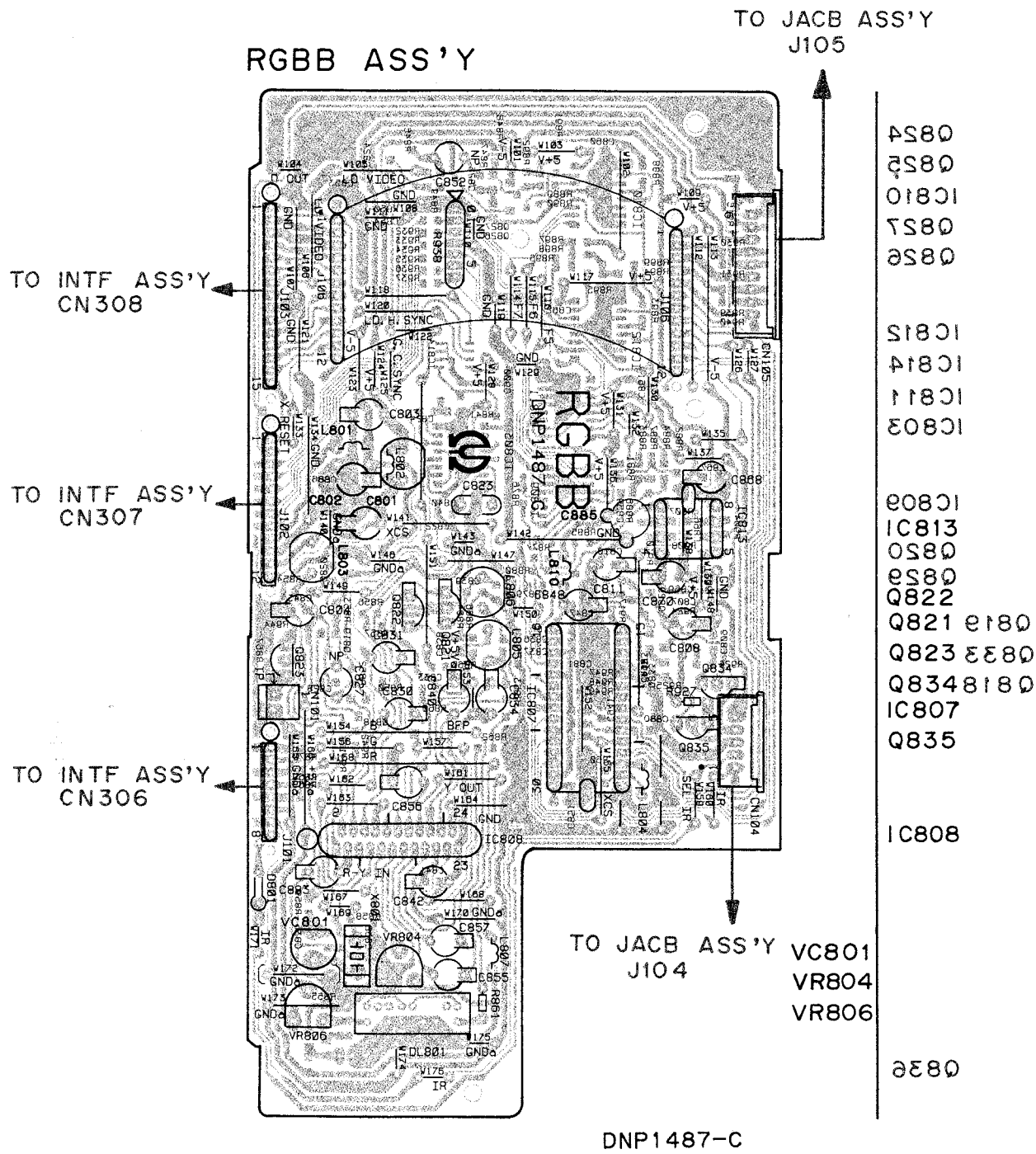
D

A

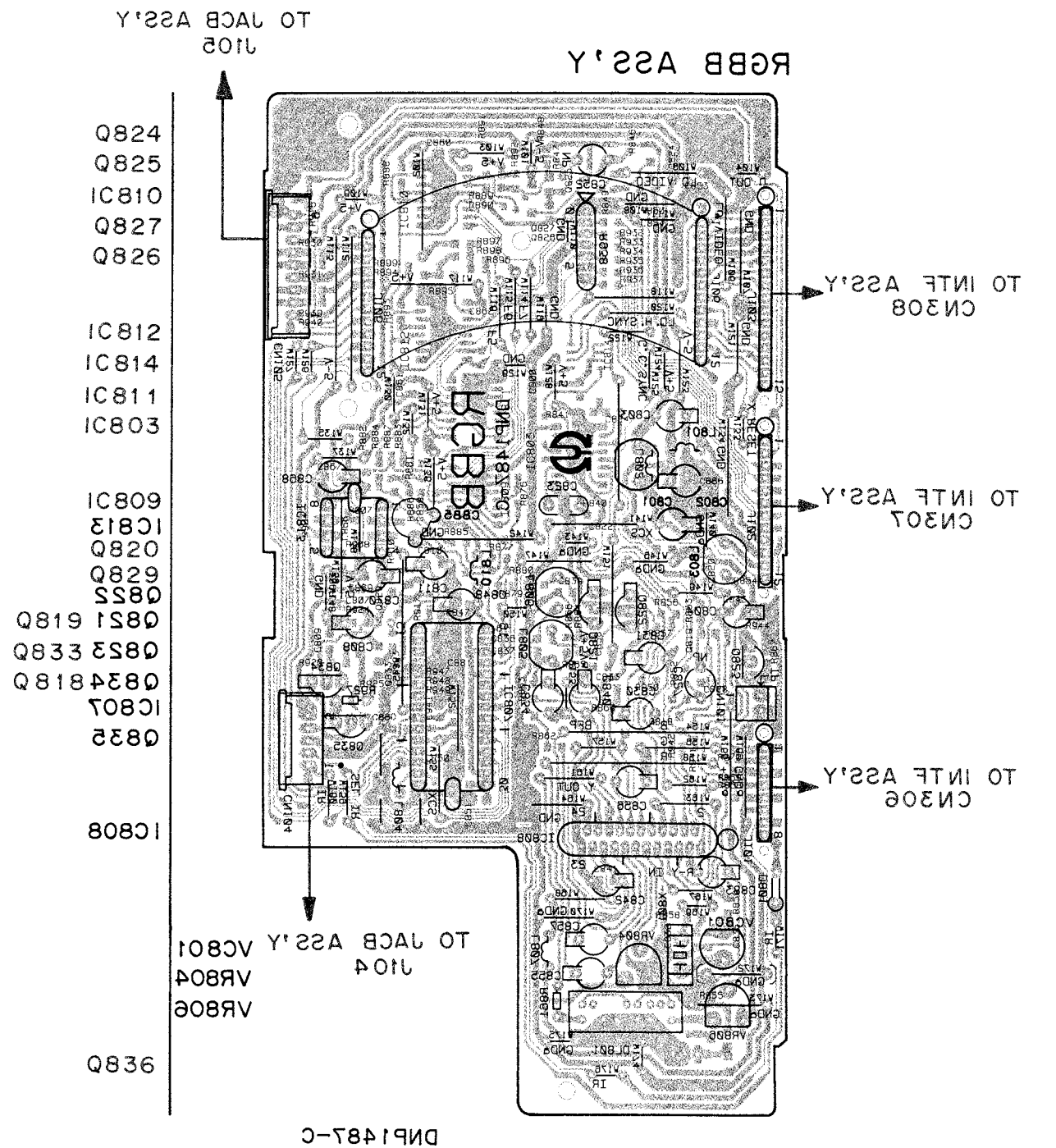
B

C

D



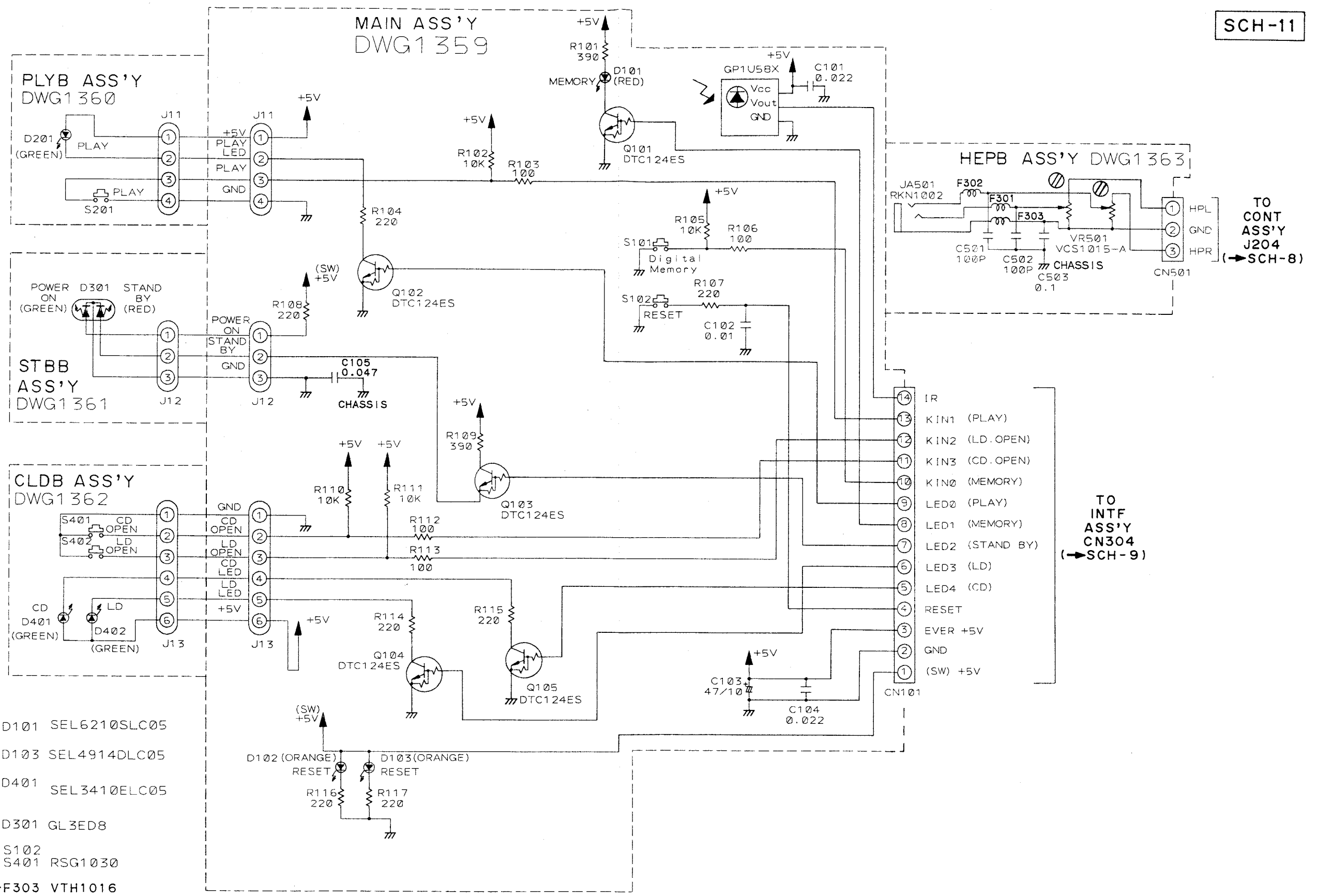
- Q854
- Q855
- IC810
- Q857
- Q858
- IC815
- IC814
- IC811
- IC803
- IC809
- IC813
- Q820
- Q823
- Q822
- Q821
- Q823
- Q834
- IC807
- Q835
- IC808
- IC801
- VC801
- VR804
- VR806
- Q836



- Q824
- Q825
- IC810
- Q827
- Q826
- IC812
- IC814
- IC811
- IC803
- IC809
- IC813
- Q820
- Q823
- Q822
- Q821
- Q823
- Q834
- IC807
- Q835
- IC808
- IC801
- VC801
- VR804
- VR806
- Q836

5.11 PLYB, STBB, CLDB, MAIN, HEPB ASS'Y

SCH-11



- D101 SEL6210SLC05
- D102, D103 SEL4914DLC05
- D201, D401 SEL3410ELC05
- D402
- D301 GL3ED8
- S101, S102
- S201, S401 RSG1030
- S402
- F301-F303 VTH1016

SCH-11

PLYB ASSY, STBB ASSY, CLDB ASSY, MAIN ASSY, HEPB ASSY

PLYB ASSY, STBB ASSY, CLDB ASSY, MAIN ASSY, HEPB ASSY

SCH-11

This PCB connection diagram is viewed from the parts mounted side.

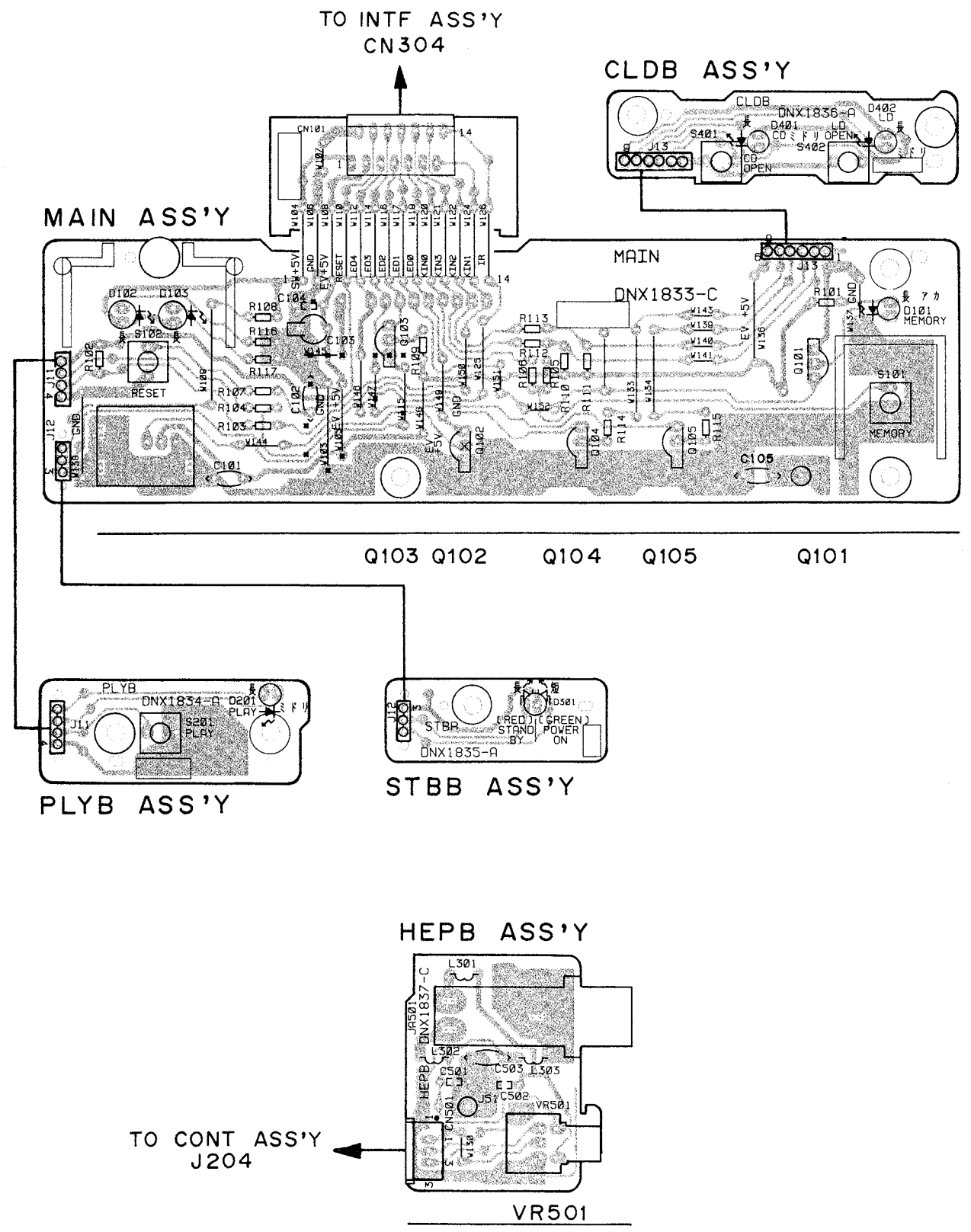
PCB-8

A

B

C

D



This PCB connection diagram is viewed from the foil side.

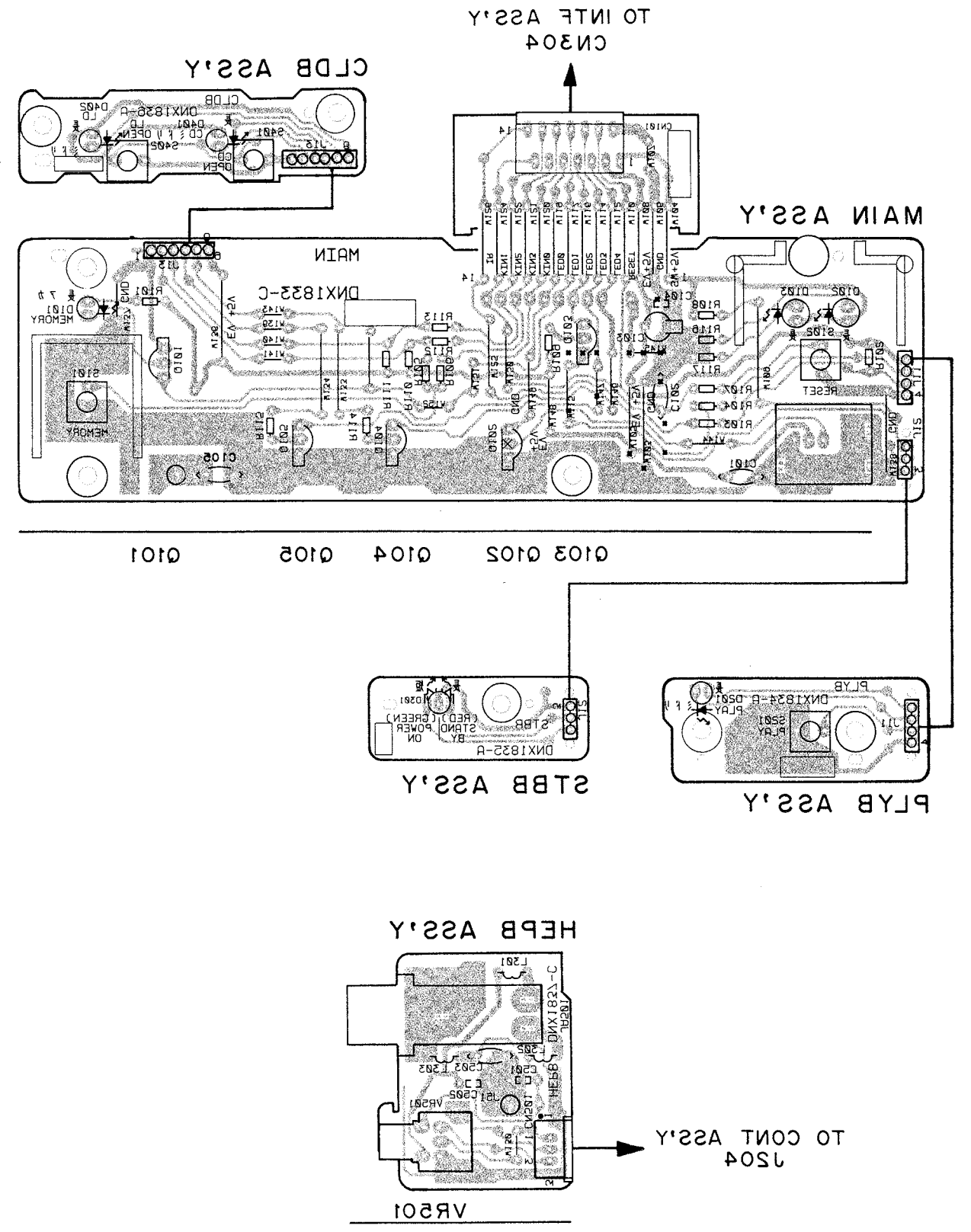
PCB-8

A

B

C

D



## 6. PCB PARTS LIST

- NOTES:**
- Parts marked by "NSP" are generally unavailable because they are not in our Master Spare Parts List.
  - The  $\Delta$  mark found on some component parts indicates the importance of the safety factor of the part. Therefore, when replacing, be sure to use parts of identical designation.
  - Parts marked by "●" are not always kept in stock. Their delivery time may be longer than usual or they may be unavailable.
  - When ordering resistors, first convert resistance values into code form as shown in the following examples.
- Ex.1 When there are 2 effective digits (any digit apart from 0), such as 560 ohm and 47k ohm (tolerance is shown by J = 5%, and K = 10%).

560Ω → 56 × 10<sup>1</sup> → 561 ..... RD1/8PM  $\begin{matrix} 5 & 6 & 1 \\ \hline & & J \end{matrix}$   
 47kΩ → 47 × 10<sup>3</sup> → 473 ..... RD1/4PS  $\begin{matrix} 4 & 7 & 3 \\ \hline & & J \end{matrix}$   
 0.5Ω → 0R5 ..... RN2H  $\begin{matrix} 0 & R & 5 \\ \hline & & K \end{matrix}$   
 1Ω → 010 ..... RS1P  $\begin{matrix} 0 & 1 & 0 \\ \hline & & K \end{matrix}$

Ex.2 When there are 3 effective digits (such as in high precision metal film resistors).  
 5.62kΩ → 562 × 10<sup>1</sup> → 5621 ..... RN1/4PC  $\begin{matrix} 5 & 6 & 2 & 1 \\ \hline & & & F \end{matrix}$

Mark No.	Description	Parts No.	Mark No.	Description	Parts No.
----------	-------------	-----------	----------	-------------	-----------

### LIST OF ASSEMBLIES

NSP	KEIH ASSY	DWM1343
NSP	└─ MAIN ASSY	DWG1359
NSP	└─ PLYB ASSY	DWG1360
NSP	└─ STBB ASSY	DWG1361
NSP	└─ CLDB ASSY	DWG1362
NSP	└─ HEPB ASSY	DWG1363
NSP	CONT ASSY	DWM1342
NSP	└─ CONT ASSY	DWG1367
NSP	└─ PWSW ASSY	DWG1368
	INTF ASSY	DWM1341
	SYPS ASSY	DWR1156
NSP	VIDEO ASSY	DWM1340
NSP	└─ VIDEO ASSY	DWV1132
NSP	└─ JACB ASSY	DWX1349
NSP	MACB ASSY	DWM1344
NSP	└─ FG ASSY	DWG1354
NSP	└─ PKSB ASSY	DWG1355
NSP	└─ CAMB ASSY	DWG1356
NSP	└─ LOSB ASSY	DWG1357
NSP	└─ LOMB ASSY	DWG1358
	RGBB ASSY	DWM1346
	FTSB ASSY	DWS1191

### MAIN ASSY

SEMICONDUCTORS	
Q101-Q105	DTC124ES
D102,D103	SEL4914DLC05
D101	SEL6210SLC05
SWITCHES	
S101,S102	RSG1030
CAPACITORS	
C103	CEJA470M10
C102	CKCYF103Z50
C101	CKCYF223Z50
C105	CKCYF473Z50
C104	CKPUYF223Z25

### RESISTORS

R103,R106,R112,R113	RD1/6PM101J
R102,R105,R110,R111	RD1/6PM103J
R104,R107,R108,R114-R117	RD1/6PM221J
R101,R109	RD1/6PM391J

### OTHER

CN101	AMP Connector (14P)	6-176927-4
	Cable Holder (3P)	51048-0300
	Remote sensor	GP1U58X

### PLYB ASSY

SEMICONDUCTORS	
D201	SEL3410ELC05

### SWITCHES

S201	RSG1030
------	---------

### STBB ASSY

SEMICONDUCTORS	
D301	GL3ED8

### OTHER

	Cable Holder (3P)	51048-0300
--	-------------------	------------

### CLDB ASSY

SEMICONDUCTORS	
D401,D402	SEL3410ELC05

### SWITCHES

S401,S402	RSG1030
-----------	---------

### CONT ASSY

SEMICONDUCTORS	
IC352	M51131L
IC408-IC411,IC453	NJM4558D
IC201	PD0178C
Q453,Q454	2SC1740S
Q405,Q406	2SD2144S

Mark No.	Description	Parts No.	Mark No.	Description	Parts No.
----------	-------------	-----------	----------	-------------	-----------

Q407,Q455	DTA124ES
Q408,Q456	DTC124ES
D405-D410	1SS254
D401-D404	MTZ6.2B/C

### COILS, FILTERS

L201	LFA100J
------	---------

### CAPACITORS

C204,C205	CCCCH300J50
C485	CEALNP2R2M35
C443	CEANP100M16
C491	CEANP330M16
C411	CEANP4R7M35

C403,C406-C408	CEAS100M50
C201	CEAS101M10
C404	CEAS220M50
C484	CEAS331M16
C401,C410	CEAS470M16

C439-C442,C469	CEJA100M16
C450,C451,C458,C459,	CEJA101M10
C462,C463,C482,C483	
C409	CEJA470M16
C405	CEJA4R7M50

C444-C446	CEJANP100M16
C460,C461	CEJANP220M10
C412	CEJANP4R7M35
C456,C457	CFTXA102J50
C452,C453	CFTXA152J50

C464	CFTXA393J50
C454,C455	CFTXA682J50
C202,C402,C470,C492,C493	CKCYF473Z50
C448,C449	CKPUYB681K50
C203	CKPUYF103Z25

### RESISTORS

All resistors	RD1/6PM $\begin{matrix} \square & \square & \square \\ \hline & & J \end{matrix}$
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### OTHER

CN205-CN207	JE Connector plug	17PS-JE
	Cable holder (3P)	51048-0300
	Cable holder (8P)	51048-0800
J204	Flat cable (3P)	D20PY Y0360E
J201	Flat cable (10P)	D20PY Y1025E

J202,J203	Flat cable (14P)	D20PYY1425E
J211	Flat cord (8P)	DDD1075
J210	Flat cord (10P)	DDD1076
J209,J212	Flat cord (14P)	DDD1077
	Screw terminal	VNE1856

X101	Ceramic resonator (9.00MHz)	VSS1040
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### PWSW ASSY

SWITCHES	
S101	DSG1042

### INTF ASSY

#### SEMICONDUCTORS

IC311	CXD2500BQ
IC302	MBM27C512P (ROM)
IC308	DYW1319
IC307	HD74HC00FP
IC312	HD74HC10FP
	HD74HC157FP

IC317	HD74HC4053FP
IC303	HD74HC573FP
IC306	HD74HC74FP
IC313	LC7883KM
IC318	M51131L

IC314,IC315	NJM4558M
IC320	NJM78L05A
IC310	PST529C
IC316	TC74HCU04AF
IC301	UPD78237GC-3B9
	GGC1026

Q305,Q308	2SC2412K
Q302,Q306,Q307	DTA144ES
Q301	DTC114ES
Q310	DTC124EK
D302,D303,D305,D306	DAN202K

D307	ERA83-006
D301	FC54M

### COILS, FILTERS

L305	LAU010K
L320	LFA010J
L308-L310	LFA2R2J
F301-F303	DTH1157

### CAPACITORS

C510	CCSQCH100D50
C404-C411,C462,C463	CCSQCH101J50
C438	CCSQCH120J50
C439	CCSQCH360J50
C418	CEAL100M16

C453	CCSQCH220J50
C401,C416,C433	CEAL101M6R3
C520	CEAL470M10
C444,C446,C448,C451	CEAL470M6R3
C428	CEALNPR47M50

C436	CEANPR47M50
C466,C467,C501	CEAS100M16
C705-C707,C710,C711	CEAS101M6R3
C473	CEAS220M25
C427,C441	CEAS221M6R3

C560,C709	CEAS331M6R3
C442,C454,C470	CEAS470M10
C492	CEAS471M6R3
C469	CEJA220M16
C468	CEJA470M10

C420	CEJA4R7M50
C701-C704	CGCYX104M25
C434	CKSQYB152K50
C419	CKSQYF102Z50
C431,C440,C445,C452,C455,C464	CKSQYF103Z50

Mark	No.	Description	Parts No.	Mark	No.	Description	Parts No.
	C402,C413,C426,C429,C430,C435,C443,C447,C449,C450,C458,C498		CKSQYF104Z50	<b>VIDEO ASSY</b>			
	C403,C412,C414,C415,C417,C421,C425,C437,C456,C457,C460,C493-C497,C550		CKSQYF223Z50	<b>SEMICONDUCTORS</b>			
	C432,C459		CKSQYF473Z50	IC815		BA10393N	
	C472		CQMA223J50	IC801		BA15218N	
	C491 (1200, 6.3V)		DCH1055	IC1		CA0002AM	
				IC666		HD74HC221P	
				IC603		MB40568P	
<b>RESISTORS</b>				IC605		MB40778	
R398	(22K,1W)		RA3T223J	IC301		MC141621FU	
R403	(22K,1W)		RA6T223J	IC901		MM1109XS	
R404	(220K)		RA6T224J	IC604		MN4700	
R397,R400	(22K, 1/10W)		RA8T223J	IC602		MN4760S	
	Other resistors		RS1/10S□□□□	IC607,IC609		NJM082S	
				IC611		NJM4558D	
<b>OTHER</b>				IC612		NJM4558S	
CN301-CN303	JE Connector Socket		17R-JE	IC606		PA4016	
CN304	AMP Connector (14P)		6-176746-4	IC401		PA5013A	
CN310	KR Connector		B2B-PH-K	IC601		PDB011	
CN311	5P Top post (NH)		B5P-SHF	IC608,IC817,IC818		TC4S66F	
CN309	Half Pitch Connector (120P)		DKN1097	IC403,IC816		TC4W53F	
	Cable Holder (6P)		51048-0600	IC804		TC5081AP	
J305	Flat cable (6P)		D20PYY0620E	IC820		TC74HC123AP	
	Earth plate		DNF1446	IC802		TC74HC4053AP	
	IC Socket (28P)		VKH1001	IC613		TC7WU04F	
X301	Ceramic resonator (12.00MHz)		DSS1039	IC610		VTX1001	
				Q211,Q218,Q301,Q303,Q305,Q314,Q417,Q430,Q431,Q605,Q618,Q621,Q631,Q644,Q645,Q701,Q703,Q813,Q823,Q902		2SA1037K	
X302	Crystal oscillator (16MHz)		VSSI051	Q626,Q628,Q633		2SA933S	
				Q312		2SB1237X	
				Q625,Q627		2SC1740S	
<b>SYPS ASSY</b>				Q1,Q2,Q209,Q210,Q212,Q216,Q217,Q219,Q302,Q306,Q317,Q401,Q402,Q406,Q409,Q424,Q432,Q601-Q603,Q606,Q607,Q610,Q611,Q615,Q616,Q622,Q624,Q630,Q636,Q643,Q702,Q814,Q815,Q821,Q822,Q900,Q901,Q903		2SC2412K	
<b>SEMICONDUCTORS</b>				Q315		2SD1858X	
IC101,IC102			ICP-N15	Q316,Q407,Q408,Q612,Q614,Q617,Q818		DTA124EK	
IC201			ICP-N25	Q313,Q422,Q423,Q604,Q608,Q609,Q613,Q619,Q816,Q817		DTC124EK	
IC202,IC301			ICP-N50	D601		1S2339	
IC203			UPC1093J	D301,D302		1S2471	
Q301			2SA1015	D602-D604,D607-D612		1SS254	
				D802		FC54M/456	
Q201,Q302			2SA1307				
Q101,Q102			2SB1185	<b>COILS, FILTERS</b>			
Q202			2SC1815	L429,L430,L606		LAU100J	
Q2,Q3			2SC2655	L406,L407,L415,L601,L611,L625,L626,L900		LAU120J	
Q1			2SC4275	L422		LAU121J	
				L607		LAU150J	
Q103,Q104			2SD1762	L302		LAU180J	
D4,D5			1SSI78TPA				
D1			D2SB40-4001				
D104-D107			ERA91-02V				
D3			ERB44-02V				
D2			ERB44-04V				
D301			ERB83-004				
D101,D102			ERC91-02L				
D201			ESAB82M				
D6			PS2501				
D302			RD5.6ES				

Mark	No.	Description	Parts No.	Mark	No.	Description	Parts No.
	L201	L204,L301,L305,L306, L404,L405,L417,L602,L612, L619	LAU220J		C626		CEAL220M16
	L3,L303,L608		LAU270J		C905		CEAL470M6R3
	L610,L613,L617,L618,L620 L403,L633		LAU2R2M		C637,C811		CEANP010M50
	L411,L426,L428,L603,L605 L622		LAU330J		C619,C664		CEANP4R7M35
	L409		LAU390J		C665		CEANPR47M50
	L427,L604		LAU3R3J		C435,C688,C910		CEAS010M50
	L1,L2,L408,L416		LAU430J		C462,C653		CEAS100M50
	L401		LAU470J		C7,C218,C219,C234,C235,C254, C255,C310,C313,C315,C316,C320, C327,C602,C608,C634,C642,C655, C678,C679,C681,C682,C685,C687, C689,C700,C709		CEAS101M10
	L410		LAU560J		C648		CEAS220M16
	L304,L634		LAU5R6J		C668		CEAS220M25
	L418		LAU620J		C323		CEAS221M6R3
	F2 (2.3MHz)		LFA220J		C908		CEAS3R3M50
	F1 (2.8MHz)		LFA561J		C3,C12,C17,C417,C426,C428,C434, C455,C456,C461,C472,C490,C492, C641,C658,C660,C663,C680,C713, C722,C825,C885,C891		CEAS470M10
			VTF1048		C332,C334,C464,C607,C913		CEAS471M6R3
			VTF1049		C16		CEJA100M16
<b>CAPACITORS</b>			VCM1005		C819,C821		CEJA101M10
	VC901		CCCCH181J50		C14		CEJANP010M50
	C605		CCCCH221J50		C23		CEJAR47M50
	C604		CCCCH331J50		C431,C625,C666		CFTXA103J50
	C726		CCPSL560J50		C15,C458		CFTXA104J50
	C622		CCSQCH030C50		C886		CFTXA124J50
	C514,C616		CCSQCH050C50		C826		CFTXA222J50
	C411,C512,C516,C615,C617, C683,C684		CCSQCH060D50		C618		CFTXA223J50
	C226,C242		CCSQCH070D50		C10,C20		CFTXA224J50
	C302,C440		CCSQCH080D50		C469,C667,C674,C676		CFTXA473J50
	C730,C731		CCSQCH100D50		C459,C460,C706,C742		CFTXA683J50
	C409,C436,C817		CCSQCH101J50		C480,C649,C715,C723		CFTYA184J50
	C477		CCSQCH120J50		C621		CKCYB102K50
	C303,C305,C422		CCSQCH150J50		C920		CKCYF473Z50
	C222,C238,C488,C517,C611, C883		CCSQCH151J50		C901		CKPUYB101K50
	C301,C407,C468,C475,C476		CCSQCH180J50		C650		CKPUYB181K50
	C511,C614,C790		CCSQCH181J50		C632		CKPUYB331K50
	C900		CCSQCH200J50		C467,C471		CKPUYB910K50
	C418,C419		CCSQCH220J50		C441,C712		CKPUYF103Z25
	C224,C227,C240,C243,C736		CCSQCH221J50		C331,C333,C518,C519,C609,C610		CKSQYB102K50
	C2,C408,C466,C495		CCSQCH270J50		C644,C645,C797		CKSQYB222K50
	C437,C708		CCSQCH271J50		C907		CKSQYB392K50
	C442		CCSQCH330J50		C324		CKSQYB472K50
	C410,C432		CCSQCH390J50		C911		CKSQYB682K50
	C304,C306,C424,C439,C463		CCSQCH470J50		C5,C217,C220,C233,C236,C253, C256,C314,C317,C321,C326,C335, C415,C416,C421,C423,C425,C433, C443,C454,C457,C465,C473,C474, C489,C491,C623,C624,C629,C630, C640,C646,C651,C654,C659,C661, C672,C673,C686,C691,C694,C697, C702,C714,C721,C791,C794,C795, C812,C813,C818,C820,C858,C882, C884,C887,C902,C912		CKSQYF103Z50
	C223,C239,C405,C406,C412, C420,C438,C453,C612,C613		CCSQCH560J50				
	C225,C241,C513,C515		CCSQCH910J50				
	C1,C4		CCSQSL561J50				
	C906,C909		CCSQSL681J50				
	C903,C904		CEAL010M50				
	C620,C707		CEAL101M6R3				
	C914,C922						

Mark	No.	Description	Parts No.	Mark	No.	Description	Parts No.
		C6,C13,C18,C311,C312,C325,C328, C329,C340,C638,C657,C716,C720, C745,C799,C802,C803,C881 C307	CKSQYF104Z25	<b>JACB ASSY</b>			
		C24,C725,C737—C740,C792,C793 C627,C633,C669,C733 C921 C892 C429	CKSQYF223Z50  CKSQYF473Z25 CQMA102J50 CQMA124J50 CQMA222J50 CQMA272J50	<b>COILS, FILTERS</b> L101			
		C705 C11,C22 C8,C9,C19,C21,C635 C670 C606	CQMA332J50 CQMA393J50 CQMA472J50 CQMA682J50 CQMA821J50	<b>CAPACITORS</b> C106,C107 C101 C113 C102,C104,C105,C111			
				<b>RESISTORS</b> R101,R102 Other resistors			
				<b>OTHER</b> JA102 Pin jack (4P) JA101 Optical output module JA104 Pin jack (Video) JA103 Pin jack (RF) JA105 Mini jack (2P)  Cable Holder (3P) Shield plate			
				<b>RESISTORS</b> RD1/6PM750J RS1/10S□□□J			
				<b>OTHER</b> DKB1038 GP1F32T VKB—014 VKB1029 VKN—183  51048—0300 DNH1842			
<b>RESISTORS</b>				<b>FG ASSY</b>			
		VR482 (2.2K) VR802,VR808 (22k) VR201,VR202 VR521,VR807 (4.7K) VR401	VRTB6VS222 VRTB6VS223 VRTB6VS332 VRTB6VS472 VRTG6VS221	<b>SEMICONDUCTORS</b> D1			
		R8,R9,R617,R619,R663 R671,R779,R796 R759,R845 R623 R704—R711	RD1/6PM102J RD1/6PM103J RD1/6PM104J RD1/6PM124J RD1/6PM181J	<b>OTHER</b> 64 HOUSING ASS'Y			
		R620 R471,R743 R453,R602,R747 R601,R828 R317,R728,R925	RD1/6PM220J RD1/6PM221J RD1/6PM222J RD1/6PM332J RD1/6PM472J	<b>PKSB ASSY</b>			
		R638 R408 R1,R606,R612 R311 R688	RD1/6PM473J RD1/6PM680J RD1/6PM681J RD1/6PM682J RD1/6PM822J	<b>SWITCHS</b> S4,S5			
		R450 R699,R701 R413 R833 R429	RD1/6PM911J RN1/6PQ1002F RN1/6PQ1203F RN1/6PQ1801F RN1/6PQ2002F	<b>OTHER</b> 72 HOUSING ASS'Y			
		R831 R698,R700 R405,R406 R835 R412	RN1/6PQ2201F RN1/6PQ2202F RN1/6PQ2402F RN1/6PQ4701F RN1/6PQ5101F	<b>CAMB ASSY</b>			
		Other resistors	RS1/10S□□□J	<b>SEMICONDUCTORS</b> Q10			
				<b>CAPACITORS</b> C12,C13 C10,C11			
<b>OTHER</b>				<b>RESISTORS</b> R10 R11			
		TC401 Ceramic Trimmer HOUSING ASS'Y(2P) X602 Crystal resonator (18.1MHz) X601 Crystal resonator (14.318MHz) PCB Binder	VCM—006 DKP2626 DSS1035 VSS1044 VEF1040	<b>OTHER</b> CN404 Connector CN402 Connector CN403 Connector (23P) CN401 Connector (23P) HOUSING ASS'Y			
				B3B—PH—K—S B3B—PH—K—R HLEM23R—1 VKN1073 DKP2783			

Mark No.	Description	Parts No.	Mark No.	Description	Parts No.
<b>LOS B ASSY</b>			C885		CEAL101M6R3
<b>SWITCHS</b>			C868,C870		CEAL470M6R3
SI - S3		DSG1015	C852		CEANP010M50
			C883		CEAS010M50
			C808,C811		CEAS221M6R3
<b>LOMB ASSY</b>			C804,C842,C848		CEAS331M6R3
<b>CAPACITORS</b>			C830,C831,C834,C840,C855 - C857		CEJA010M50
C1		CGCYX473M25	C801 - C803		CEJA101M10
			C827		CEJANP010M50
			C822,C828,C829,C841,C843,		CKSQYF103Z50
<b>HEPB ASSY</b>			C853,C854,C859 - C862,C867,		
<b>COILS, FILTERS</b>			C869,C900		
F301 - F303		VTH1016	C807,C810,C847,C851		CKSQYF104Z25
			C833,C881,C886		CKSQYF473Z50
			C823		CQMA122J50
<b>CAPACITORS</b>			<b>RESISTORS</b>		
C503		CGCYX104M25	VR806 (1K)		VRTB6VSI02
C501,C502		CKPUYB101K50	VR804 (10K)		VRTB6VSI03
<b>RESISTORS</b>			R938 (10K)		RA6T103J
VR501 (0.5K)		VCSI015	R861		RD1/6PM102J
			R927		RD1/6PM470J
<b>OTHER</b>				Other resistors	RS1/10S□□□□J
CN501	Jumper connector (2MMP)	52151 - 0310			
JA501	Headphone Jack	RKN1002			
J13	Flat cable (6P)	D20PWW0625E	<b>OTHER</b>		
J11	Flat cable (4P)	D20PWY0415E		Cable Holder (8P)	51048 - 0800
J12	Flat cable (3P)	D20PYY0320E		Cable Holder (12P)	51048 - 1200
			J103	Flat cord (15P)	D20PYY1510E
<b>RGBB ASSY</b>			X801	Crystal oscillator (3.579545MHz)	PSS1012
<b>SEMICONDUCTORS</b>			DL801	Delay line	PTF1013
IC808		BA7230LS		PCB Binder	VEF1040
IC803		HD74HC221FP			
IC813		MC14577BP	<b>FTSB ASSY</b>		
IC807		PD0093A	<b>SEMICONDUCTORS</b>		
IC814		TC4W53F	IC802		BA15218N
			IC801		CXA1081S
IC809 - IC812		TC74HC4053AF	IC810,IC811		ICP - N10
Q820,Q824,Q827,Q833		2SA1037K	IC804		LA6510
Q834,Q835		2SC1740S	IC501		NJM072L
Q818,Q819,Q825,Q826,Q829		2SC2412K			
Q821,Q822		2SC2458	IC803		PM3003A
			IC805		TC4W53F
Q823		2SK30ATM	Q105,Q106,Q806,Q808,Q812,		2SA1037K
D801		1SS133X	Q819,Q832,Q836		
			Q503		2SA1399
<b>COILS, FILTERS</b>					
L801		LAU010K	Q402,Q816,Q818		2SB1185
L807		LAU100J	Q802 - Q805,Q807,Q809,Q810,		2SC2412K
L810		LAU220J	Q814,Q825,Q838		
L804		LAU470J	Q401,Q815,Q817		2SD1762
L802,L803		LFA100J	Q821		2SK184
L805,L806		LFA122J	Q820,Q824,Q826,Q829,Q830		DTA124EK
			Q107,Q811,Q823,Q827,Q828,		DTC124EK
<b>CAPACITORS</b>			Q835,Q837,Q839,Q841		
VC801		DCM1005	D501,D502,D801,D804 - D808		1SS254
C850		CCSQCH100D50	D401,D402		MTZ9.1C
C809,C880,C941		CCSQCH101J50			
C849		CCSQCH120J50			
C836,C837		CCSQCH220J50			
C824,C838,C839,C866		CCSQCH330J50			
C835		CCSQCH680J50			
C832		CCSQCH820J50			



Mark No.	Description	Parts No.	Mark No.	Description	Parts No.
<b>COILS, FILTERS</b>			C502		CQMA333J50
L801,L803		LAU151J	C898		CQMA472J50
L802		LAU181J	C825		CQMA682J50
<b>CAPACITORS</b>			<b>RESISTORS</b>		
C837,C871		CCCSL331J50	VR603,VR609	(10K)	VRTB6VSI03
C817		CCSQCH050C50	VR620	(15K)	VRTB6VSI53
C895		CCSQCH100D50	VR601,VR605,VR606,VR611	(2.2K)	VRTB6VS222
C810,C811,C822		CCSQCH101J50	VR604	(4.7K)	VRTB6VS472
C806,C812,C815		CCSQCH270J50	VR610		VRTB6VS473
C804,C890,C891,C893		CCSQCH470J50	R913		RD1/6PM101J
C809,C813		CCSQCH680J50	R962		RD1/6PM102J
C818		CCSQL471J50	R923		RD1/6PM103J
C819		CCSQL561J50	R917		RD1/6PM123J
C808,C823		CEAL010M50	R507		RD1/6PM225J
C896		CEAL470M16	R402,R406		RD1/6PM331J
C814,C845		CEANP010M50	R528,R529,R976		RD1/6PM470J
C915		CEANP100M16	R841,R910-R912		RD1/6PM563J
C850		CEANP2R2M50	R934		RD1/6PM681J
C870		CEANP470M10	R850,R862 (3.3)		RS1LMF3R3J
C866		CEANPR47M50		Other resistors	RS1/10S□□□J
C816		CEAS010M50	<b>OTHER</b>		
C864		CEAS100M50	CN807	Top post (11P)	B11P-SHF-1AA
C512		CEAS101M10	CN806	Connector	B2B-PH-K
C515,C876,C877		CEAS220M50	CN803	Connector (23P)	VKN1013
C405,C406,C857,C859		CEAS221M10	J801	Flat cable (11P)	D20PYY1130G
C401,C402,C941,C942		CEAS221M16		PCB Binder	VEF1040
C897		CEAS470M10			
C550,C551		CEAS470M16			
C840		CEHAQ010M50			
C835,C836		CEHAQ220M50			
C855		CEJA100M50			
C842,C863		CEJANP100M16			
C849,C873		CFTXA103J50			
C504,C505,C832,C838,C874		CFTXA104J50			
C807		CFTXA124J50			
C843		CFTXA223J50			
C827,C848,C867		CFTXA333J50			
C869,C910		CFTXA473J50			
C847,C868		CFTXA683J50			
C883		CFTXA823J50			
C852,C900		CFTYA224J50			
C403,C404,C407,C408		CGCYX473M25			
C854		CKPUYB821K50			
C513		CKSQYB102K50			
C879		CKSQYB562K50			
C501,C503,C511,C801-C803, C824,C828,C829,C875		CKSQYF103Z50			
C510,C851,C858,C860, C880-C882		CKSQYF104Z25			
C805,C820,C878		CKSQYF473Z25			
C931		CKSQYF473Z50			
C839		CQMA102J50			
C834		CQMA152J50			
C899		CQMA272J50			
C853		CQMA332J50			

# 7. ADJUSTMENTS

## 7.1 TEST MODE

### 1) Test mode startup

With the CONT assembly's IC201 (PD0178) pin25 (SHAKE) connect to GND, turn ON the power switch to start up the test mode.

Use a screwdriver to short circuit the two points on the copper pattern side shown in Fig.1 and turn ON the power switch. This will make the operation easier. or, turn ON the power switch and then press the ESC key and TEST key (in this order) on the test mode remote controller (GGF1067).

### 2) Canceling the test mode

Turn OFF the power switch.

### 3) Functions and key operations during the test mode

Note : For keys which are not on the player or on the remote controller, use the test mode remote controller (GGF1067).

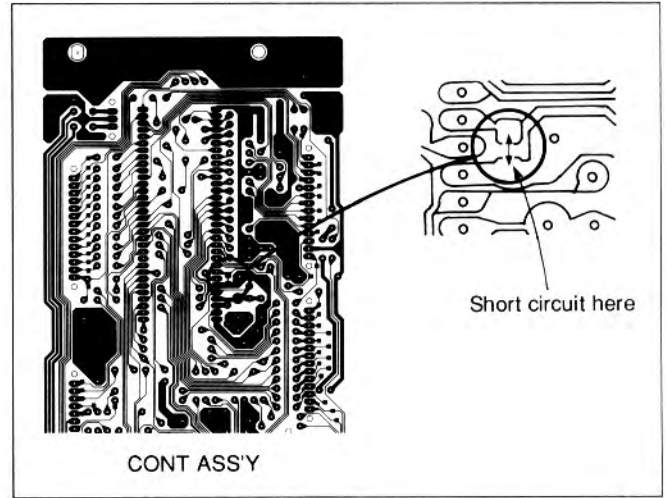


Fig. 1

### ● Key operation in the Test mode

Player Status	Key Operation	Function	Remarks
Tray Open	⏪ / ⏩ SKIP (Refer to Note 1)	⏪ : Shifts the tray in the closed direction and also raises the turn table while pressing the key. ⏩ : Shifts the tray in the open direction and also lowers the turn table while pressing the key.	
Tray Open	▶ PLAY	Clamps	
Clamp	▶ PLAY	Turns the disc through TRK Servo OFF	TRK- OFF
TRK Servo Open	▶ PLAY	TRK Servo ON	TRK- ON
TILT Neutral	+ MULTI-SPEED	TILT Servo ON	T- □: ON
TILT ON	- MULTI-SPEED	TILT Neutral	T- □: N
TILT Neutral or ON	⏪ / ⏩ SKIP	Setting TILT Servo to OFF, can force TILT to move.	T-1 to T-E
Clamp	⏪ / ⏩ SCAN	Can force the slider to move	S - LD S - CDV S - CD S - IN
Play	⏸ PAUSE	Still	
Play	■ STOP	Stop	
Stop	▲ OPEN	Open	
Play	+10 ↓ 0 to 9 ↓ ▶ PLAY	Sets to SEARCH Lead Address Input mode.  Designates the SEARCH lead address through keys 0 to 9. Press the CLEAR [C] key if the designated address is incorrect. Searches the designated address upon pressing the PLAY key.	

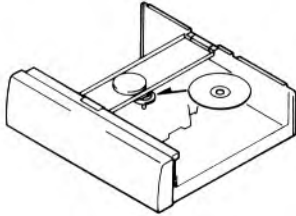
Note 1 : Press SKIP (⏪ / ⏩) Keys after the tray is set to open state by pressing Open (▲) key. Because, in tray open state, pressing PLAY (▶) key causes it to set to TILT control state and SKIP (⏪ / ⏩) keys can not function properly.

● PLAYER OPERATION IN THE TEST MODE

Operate the player by selecting a test mode function with the keys on the player or on the remote control unit.

• CD PLAYBACK

- ① Place the CD disc on the turn table.



- ② Press the PLAY (▶) key once. (Twin gear starts to move.)
- ③ Push the cam plate (Fig. 4) in the direction of the arrow and wait until the CD disc is clamped.

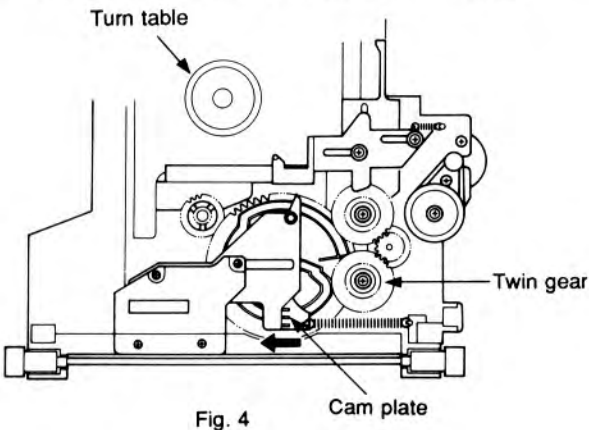
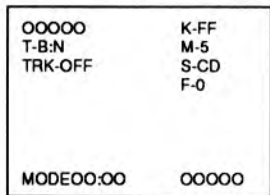


Fig. 4

- ④ Press the ◀◀ or ▶▶ keys to appear "S-CD" on the TV screen display.

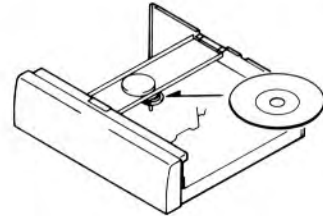


TV screen display

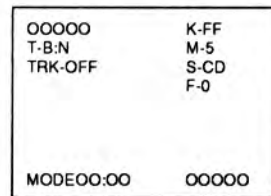
- ⑤ Press the PLAY (▶) key twice, disc will be normally playbacked.

• LD PLAYBACK

- ① Place the LD disc on the turn table.



- ② Press the PLAY (▶) key once. (Twin gear starts to move.)
- ③ Press the SKIP REV (⏮) key to raise the turn table (spindle motor section) while pressing the cam plate (Fig. 4) in the direction of the arrow. Raise it to the position where the LD disc can be easily placed on the turn table. If the turn table is raised too high, lower it with the SKIP FWD (⏭) key.
- ④ Place the LD disc on the turn table and press the PLAY (▶) key once to clamp the disc.
- ⑤ Press the ◀◀ or ▶▶ keys to appear "S-LD" on the TV screen display.



TV screen display

- ⑥ Press the PLAY (▶) key twice, disc will be normally playbacked.

## 7.2 TOOLS REQUIRED FOR ADJUSTMENTS

### ● Tools Required

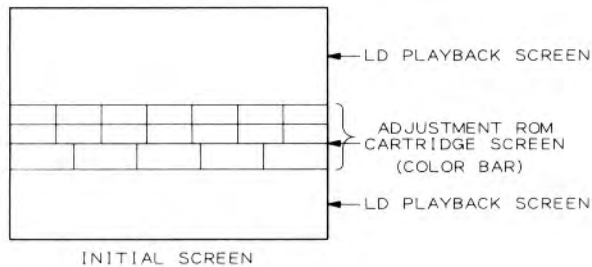
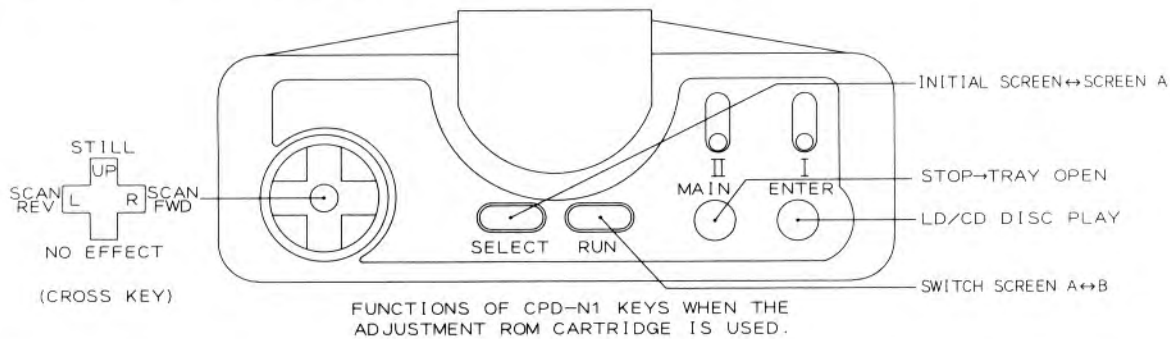
- CD test disc (STD - 901 or STD - 902)
- LD test disc (GGV1003)
- Medium-size blade screwdriver
- Small blade screwdriver
- Hexagonal wrench (with handle, 3mm sides)
- Resistors (10k ohm × 2.47k ohm × 1)
- Two-image oscilloscope (with delay)
- AF oscillator
- Frequency counter
- Digital voltmeter
- Monitor TV
- Low - pass filter
- Adjustment ROM cartridge (GGF1244)

## 7.3 ADJUSTMENT ROM CARTRIDGE (GGF1244)

### ● Adjustment ROM cartridge operation

Use the adjustment ROM cartridge as follows :

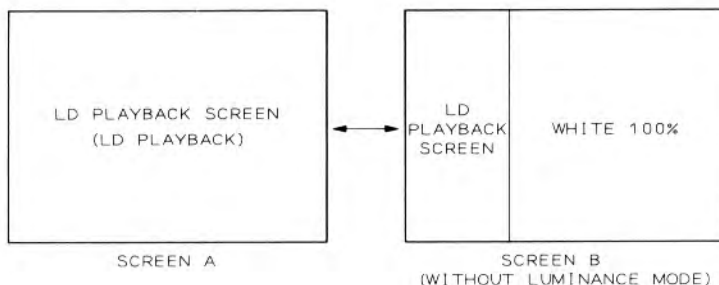
1. Turn OFF the CLD - A100 power switch.
2. Attach the PAC - N10, ROM cartridge, and CPD - N1 to the CLD - A100. Turn ON the power switch. The initial display will appear. The keys of the CPD - N1 will also have the following functions :



Note : This is used in "7.6 RGBB ASSEMBLY ADJUSTMENT" :

1. RGB encoder output level adjustment
3. APC adjustment

3. With the initial display on, press the CPD - N1's SELECT key. Display A will appear. Press the RUN key to switch between display B.



Note : This is used in "7.5 VIDEO ASSEMBLY ADJUSTMENT, 7. BRIGHTNESS KEY ADJUSTMENT."

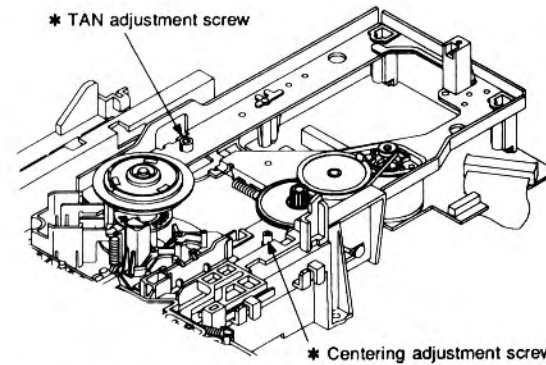
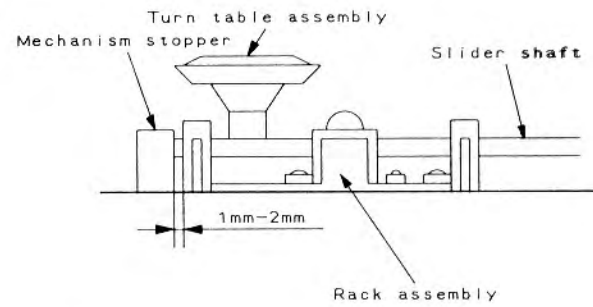
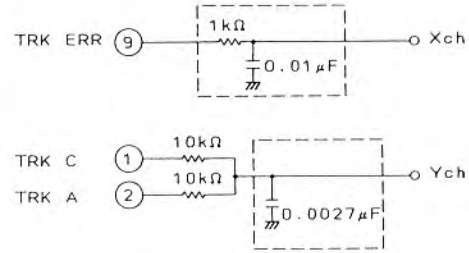
### 7.4 ADJUSTMENTS OF PICKUP ASSY AND FTSB ASSY

#### ● NOTES FOR CENTERING ADJUSTMENT

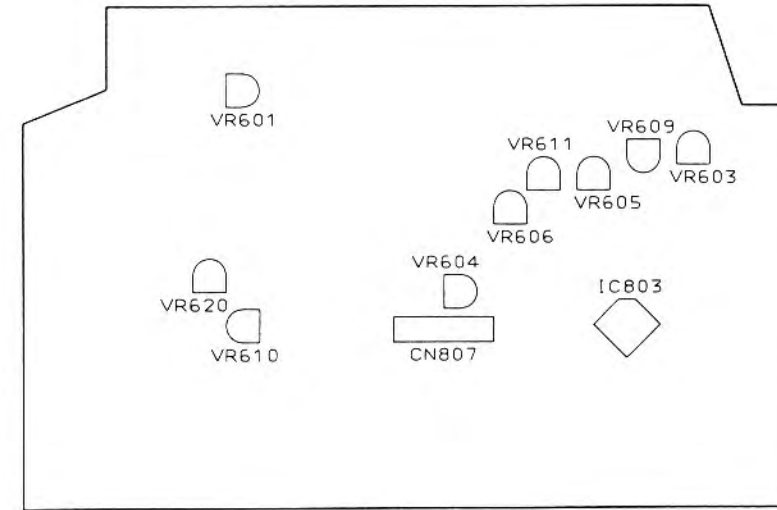
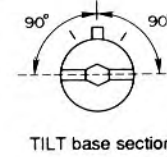
Use the low-pass filters below in the coarse centering adjustment 3. and fine centering adjustment 7. when the S/N of the waveform is heard to observe.

#### ● RACK ASSEMBLY DURING CENTERING ADJUSTMENT

The S-IN position (without hitting the mechanism stopper) of the rack assembly during centering adjustment is indicated below.



\* : As the adjustment range of both the TAN and centering adjustment screws is only ±90° from the center, do not turn the screws beyond this range.



FTSB ASS'Y Adjustment diagram

### ADJUSTMENT TABLE

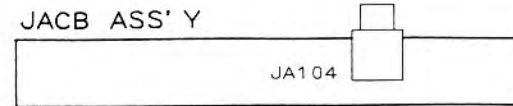
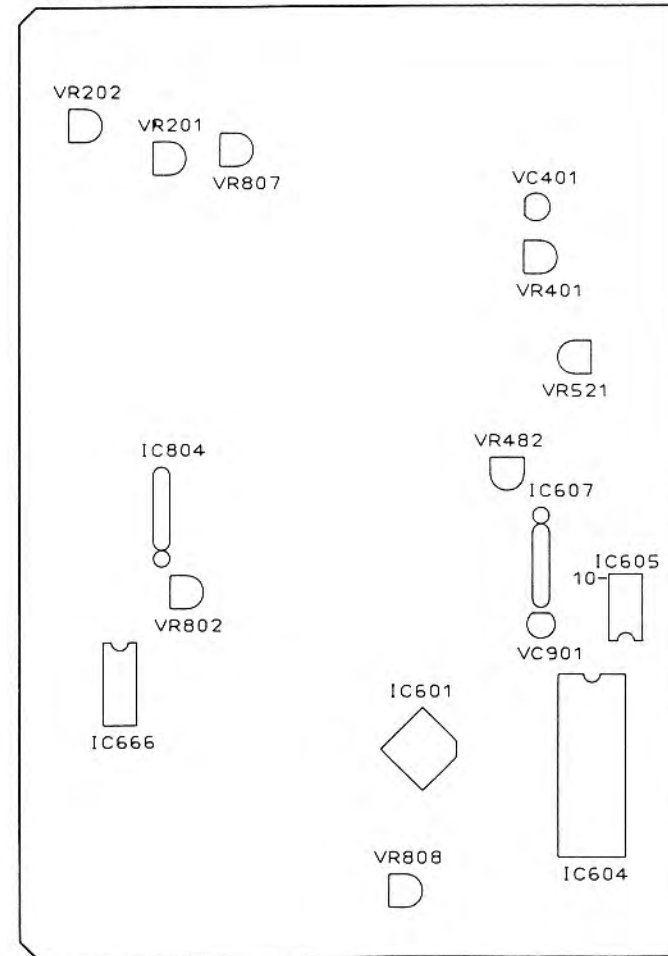
Adjustment name	Adjustment point	Measuring equipment and jigs	Measurement point	Player condition	Adjustment procedure	Waveform and connection diagram
1 Tilt Offset Check and Adjustment	FTSB assembly VR610	TV monitor	Tilt indication on Test mode screen	• Power ON • Test mode • Disc not installed	1. Check if the tilt indication on the Test mode screen is at T-6 to T-8. 2. If the tilt indication is not at T-6 to T-8, adjust VR610 until the tilt indication reaches T-6 to T-8.	
2 Tilt servo Gain adjustment	FTSB assembly VR620	—	—	• Power ON • Test mode • Disc not installed	Check the dot marking on the tilt sensor and turn VR620 below. Red...turn fully clock wise Non ...middle position Blue...turn fully counter clock wise	
3 Coarse centering adjustment	Tilt base Centering adjustment screw	• Oscilloscope • STD-901 or STD-902 • MIX resistor 	CN807 X : ⑨Pin (TRK ERR) Y : ①+②Pin (TRK SUM)	• Test mode • TRK servo OFF • Tilt servo ON • Innermost track of STD-901 or STD-902 Which dose not come in contact with the mechanical stopper.	1. Move the slider until it does not come in contact with the mechanical stopper at the slider position indication S-IN. 2. Observe TRK ERR (Xch) and TRK SUM (Ych) at the X-Y mode during TRK Servo OFF. 3. Turn the centering adjustment screw until the Lissajous' figure is horizontal.	
4 FCS balance adjustment (1) TRK ERR MAX	FTSB assembly VR605	• Oscilloscope • STD-901 or STD-902	CN807 ⑨Pin (TRK ERR)	• Test mode • TRK servo OFF • Tilt servo ON • Inner track of STD-901 or STD-902	1. Observe TRK ERR at CH1 of the oscilloscope during TRK Servo OFF. 2. Adjust VR605 until the amplitude of the waveform reaches its maximum.	
5 FCS balance adjustment (2) RF MAX	FTSB assembly VR611	• Oscilloscope • STD-901 or STD-902	CN811 ③Pin (RF)	• Test mode • TRK Servo ON • Tilt servo ON • Inner track of STD-901 or STD-902	1. TRK servo is ON and observe RF at CH1 of the oscilloscope. 2. Adjust VR611 until the amplitude of the waveform reaches its maximum and the envelope is very clear.	
6 Tangential direction angle adjustment	Tilt base TAN adjustment screw	• Oscilloscope • STD-901 or STD-902	CN811 ③Pin (RF)	• Test mode • TRK Servo ON • Tilt servo ON • Inner track of STD-901 or STD-902	1. Observe RF at CH1 of the oscilloscope during TRK Servo ON. 2. Adjust the TAN adjustment screw until the amplitude of the waveform reaches its maximum and the envelope is very clear.	

Adjustment name	Adjustment point	Measuring equipment and jigs	Measurement point	Player condition	Adjustment procedure	Waveform and connection diagram
7 Fine centering adjustment	Tilt base Centering adjustment screw	· Oscilloscope · STD-901 or STD-902	CN807 X : ⑨Pin (TRK ERR) Y : ①+②Pin (TRK SUM)	· Test mode TRK servo OFF Tilt servo ON · Innermost track of STD-901 or STD-902 which does not come in contact with the mechanical stopper.	Perform fine centering adjustment by following the same procedure as in "Coarse centering adjustment" (2).	<p>X: 200mV/div Y: 50mV/div AC mode</p> <p>Adjust until the Lissajous' figure is horizontal.</p>
8 Crosstalk check and Tilt offset adjustment	FTSB assembly VR610	· TV monitor · GGV1003	Crosstalk check screen	· Test mode TRK servo ON Tilt servo ON · GGV1003 #115 STILL	<ol style="list-style-type: none"> <li>Search for address 115 of GGV1003 and still the address.</li> <li>Check the crosstalk. If the crosstalk is pronounced, adjust VR610 until the crosstalk is not noticeable.</li> </ol>	<p>If the crosstalk is pronounced, adjust until the crosstalk is not noticeable.</p>
<p>When the crosstalk is still noticeable in spite of the adjustment in (8), use a hexagonal wrench driver (straight type, size : 3 mm) to adjust the TAN adjustment screw on the bottom side of the player through the GGV1003 #115 STILL screen. Afterwards, perform the adjustment procedures from (7).</p> <p>Package box ... etc.</p>						
9 FCS Balance adjustment (3) RF level MAX.	FTSB assembly VR606	· Oscilloscope · GGV1003	CN807 ③Pin (RF)	· Test mode TRK servo ON Tilt servo ON	<ol style="list-style-type: none"> <li>Connect the CH1 of oscilloscope to CN807-3Pin and check the RF waveform during TRKG servo is ON.</li> <li>Adjust VR606 so that the RF waveform become MAX.</li> </ol>	
10 FCS servo loop gain adjustment	FTSB assembly VR604	· Oscilloscope · GGV1003 · AF Oscillator · Resistor (47kΩ)	CN807 X : ⑦Pin (FCS IN) Y : ⑥Pin (FCS ERR)	· Test mode TRK servo ON Tilt servo ON · GGV1003 # 15,000STILL	<ol style="list-style-type: none"> <li>Search for address 15,000 of GGV1003 and still the address.</li> <li>Xch : Connect the resistor (47 kΩ) to the channel and connect to FCS IN. Ych : Connect to FCS ERR.</li> <li>Connect the AF oscillator between Xch and the 47 kΩ resistor, and adjust VR604 until the Lissajous' figure is symmetrical.</li> </ol>	<p>X: 200mV/div Y: 20mV/div DC mode</p> <p>Adjust until the Lissajous' figure is symmetrical.</p>
11 TRK servo loop gain adjustment	FTSB assembly VR603	· Oscilloscope · GGV1003 · AF Oscillator · Resistor (47kΩ)	CN807 X : ⑩Pin (TRK IN) Y : ⑨Pin (TRK ERR)	· Test mode Stop mode or TRK servo ON Tilt servo ON · GGV1003 # 15,000STILL	<ol style="list-style-type: none"> <li>Xch : Connect the 47 kΩ resistor to channel and connect to TRK IN. Ych : Connect to TRK ERR.</li> <li>Connect the AF oscillator between Xch and the 47 kΩ resistor and note the tilt angle against the horizon with the disc in the stopped state.</li> <li>Search for address 15,000 of GGV1003 and still the address.</li> <li>Set the disc in PLAY mode (TRK servo closed, TILT on). Adjust VR603 so that the tilt angle of the waveform will be the same as the tilt angle noted in step 3.</li> </ol>	<p>X: 200mV/div Y: 10mV/div DC mode</p> <p>Adjust until the Lissajous' figure is symmetrical.</p>
12 FCS SUM level check	FTSB assembly VR609	· Oscilloscope · GGV1003	CN807 ⑪Pin (FCS SUM)	· Test mode TRKGservo ON Tilt servo ON · GGV1003 # 15,000STILL	Adjust VR609 so that the voltage of CN807-⑪Pin become 1.8 V ±0.1 V DC.	
13 RF level adjustment	FTSB assembly VR601	· Oscilloscope · GGV1003	CN807 ③Pin (RF)	· Test mode TRK servo ON Tilt servo ON · GGV1003 # 15,000 STILL	<ol style="list-style-type: none"> <li>Search for address 15,000 of GGV1003 and still the address. Observe RF at CH1 of the oscilloscope.</li> <li>Adjust VR601 until the RF amplitude is 300 mV ±50 mV p - p.</li> </ol>	

### 7.5 ADJUSTMENTS OF VIDEO ASSY

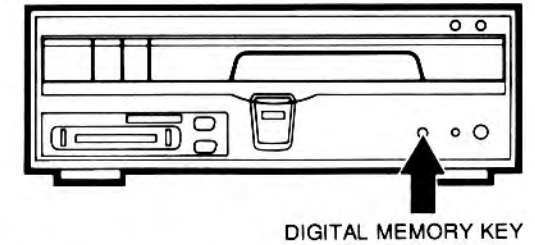
• VIDEO ASSEMBLY ADJUSTMENT DIAGRAM

VIDEO ASS'Y



• VIDEO ASSEMBLY ADJUSTMENT NOTES

- To switch between the through mode and memory mode, press the DIGITAL MEMORY key on the CLD - A100.
- Before removing or installing the pack, be sure to turn OFF the power switch.
- Using the LD video and game video together  
When the LD video and game video are used together, the LD video will have field playback, with non - interlace. As a result, the vertical resolution will be half of the usual resolution. However, picture flicker will be eliminated. Even when a V shell display is executed while a normal disc (other than LD - ROM games) is played, only one field will playback due to non - interlacing. For memory through, turning the V shell ON/OFF might result in irregular tints even if the adjustment is correct. During an LD - ROM game, playback can be switched between field 1 and 2 by game software.
- Key and remote control operations during a game  
During a ROM-card based game, only the main unit's OPEN/CLOSE key will be operational. A disc can thereby be removed or loaded.
- Remote controller power ON/OFF  
The power can be turned ON/OFF with the remote controller only when a pack has not been installed. If a pack has been installed, the remote controller cannot be used to turn OFF/ON the power. This is to protect the pack. Since the remote controller cannot be used for power ON/OFF during V shell operation, the last memory function will also be cleared.
- Power OFF with the main unit's POWER key  
When the power is turned OFF with the POWER key on the main unit, the power will turn OFF immediately. IN concert with the POWER key, the pack's release mechanism will be canceled. The pack can thereby be installed or removed immediately. If, for example, the power is turned OFF while the tray is open, the power will turn OFF with the tray still open.



### ADJUSTMENT TABLE OF VIDEO ASSY

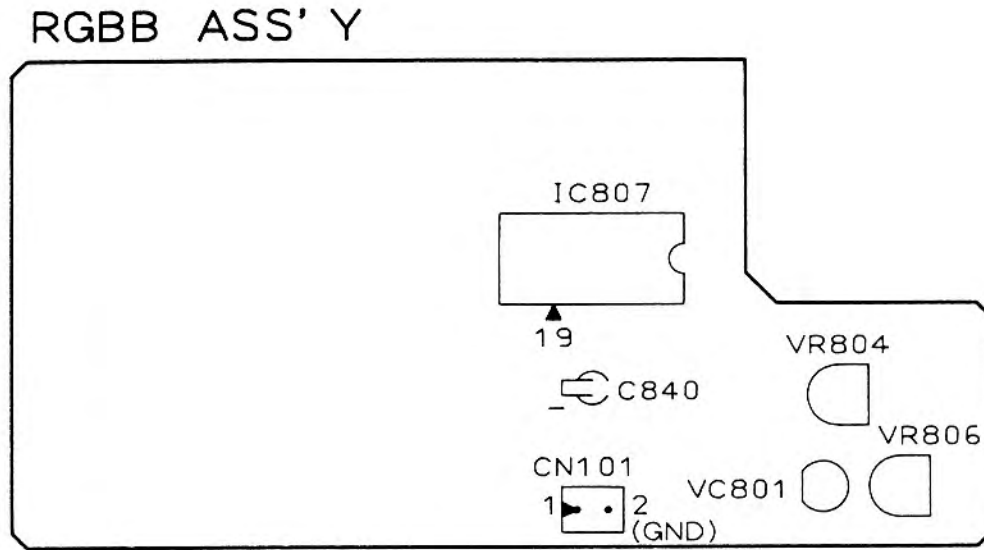
	Adjustment name	Adjustment point	Measuring equipment and jigs	Measurement point	Player condition	Adjustment procedure	Waveform and connection diagram
1	Master clock adjustment	VR808 VC901	• Frequency counter • Oscilloscope	IC605-10P IC607-8p	• STOP (POWER ON)	Connect a frequency counter to IC605-10P, with the player's power ON (STOP), adjust VR808 so that the frequency becomes 18.12587 MHz. Connect an oscilloscope to IC607-8P, adjust VC901 so that the DC voltage becomes 0.2±0.3V.	
2	Output video level adjustment (1)	VR482	• Oscilloscope • TV monitor	VIDEO output terminal (75Ω terminated)	• Through mode • #19,900Still	Connect an oscilloscope to the video output, during still playback of #19,900 of GGV1003 observe the VIDEO signal waveform in the through mode. Adjust VR482 so that the white 100% level from the sync tip becomes 1Vp-p ± 5%.	

Adjustment name	Adjustment point	Measuring equipment and jigs	Measurement point	Player condition	Adjustment procedure	Waveform and connection diagram
3 VPS error adjustment	VR521	· TV monitor	Video output terminal (75Ω terminated)	· Through mode · #8,000 Still	During still playback (magenta screen) of GGV1003 #8,000 in through mode, adjust VR521 to minimize the color irregularity on the screen.	
4 140nSEC, shift adjustment	VR401 VC401	· Oscilloscope · TV monitor	Video output terminal (75Ω terminated)	· Memory mode · #901 Still · #8,000 Still	1. Connect an oscilloscope to the video output terminal, during still playback of GGV1003 #19,900 in memory mode, adjust VR401 to minimize the amplitude changing. 2. Connect a TV monitor to the video output terminal, during still playback of GGV1003 #8,000, adjust VC401 to minimize the flicker (especially on the top of display).	
5 Output video level adjustment (2)	VR201 VR202	· Oscilloscope · Test disc (GGV1003)	Video output terminal (75Ω terminated)	· #19,900 Still · Memory mode	1. Connect an oscilloscope to the video output terminal, during still playback of GGV1003 #19,900 in the memory mode, adjust VR202 so that the white 100% level from the sync tip becomes 1Vp-p ± 5%. 2. During playback, alternately switching memory/through modes, adjust VR201 so that the ratio of chroma signal level with the white 100% level from the sync tip of the memory mode and of the through mode are the same.	
6 VCXO error adjustment	VR802	· Oscilloscope · PAC-N10	IC666-13 IC804-8	· Power switch ON · STOP	1. Turn the power switch OFF. 2. Connect IC666-13P to the oscilloscope's CH-1 and IC804-8P to CH-2, then install PAC-N10 to the main unit. 3. Turn the power switch ON, observe waveforms of CH-1 and CH-2, adjust VR802 so that each waveform's time lag becomes 1.0 ± 0.1 μsec.	
7 Luminance key adjustment (Y-COMP)	VR807	· TV monitor · PAC-N10 · CPD-N1 · Adjustment ROM cartridge (GGF1244) · LD Test disc (GGV1003)		· Power switch ON · Without luminance mode · Color bar (#5401) Still	1. Turn the power switch OFF. 2. Set PAC-N10, the adjustment ROM cartridge and CPD-N1 to the main unit, then turn the power ON. 3. Press (I) key of the CPD-N1, open the disc tray. 4. Set the GGV1003 to the tray, then press the (I) key of CPD-N1, starts playback. 5. Press the cross key (right) of CPD-N1 to scanning disc, then press the cross key (up) to still playback at the color bar (#5401). 6. Press SELECT key of CPD-N1 once, then press RUN key (without luminance mode). Adjust VR807 so that the playback screen's bottom side is white like the figure. Note: Frame No. does not appear on the display when the adjustment ROM cartridge is installed.	



7.6 ADJUSTMENTS OF RGBB ASSY

● RGBB ASSEMBLY ADJUSTMENT DIAGRAM



ADJUSTMENT TABLE OF RGBB ASSY

Adjustment name	Adjustment point	Measuring equipment and jigs	Measurement point	Player condition	Adjustment procedure	Waveform and connection diagram
1 RGBencoder output level adjustment	VR806	<ul style="list-style-type: none"> <li>• Oscilloscope</li> <li>• PAC-N10</li> <li>• Adjustment ROM cartridge (GGF1244)</li> </ul>	IC807-19		<ol style="list-style-type: none"> <li>1. Turn the power switch OFF.</li> <li>2. Connect an oscilloscope to IC807-19 pin.</li> <li>3. Set PAC-N10 and the adjustment ROM cartridge, turn the power switch ON.</li> <li>4. Observe the initial screen of the adjustment ROM cartridge by the oscilloscope, adjust VR806 so that the level between the sync tip and the white peak becomes 1.8Vp-p ±5%.</li> </ol>	<p>Waveform of the adjustment ROM cartridge initial screen</p>
2 3.58MHz free run frequency adjustment	VC801	<ul style="list-style-type: none"> <li>• Frequency counter</li> </ul>	CN101-1	<ul style="list-style-type: none"> <li>• Power switch ON</li> <li>• Connect — side of CN840 to GND.</li> </ul>	<p>Note) Remove PAC-N10 before adjustment.</p> <p>Connect a frequency counter to CN101-1 pin, adjust VC801 so that the frequency becomes 3.579545MHz ± 10Hz. (Connect the probe's GND of the frequency counter to CN101-2 pin)</p>	
3 APC adjustment	VR804	<ul style="list-style-type: none"> <li>• TV monitor</li> <li>• GGV1003</li> <li>• PAC-N10</li> <li>• CPD-N1</li> <li>• Adjustment ROM cartridge (GGF1244)</li> </ul>	TV monitor screen	<ul style="list-style-type: none"> <li>• LD screen and background overlay mode</li> <li>• GGV1003 Color bar(#5,401) still</li> </ul>	<ol style="list-style-type: none"> <li>1. Turn the power switch OFF.</li> <li>2. Set PAC-N10, the adjustment ROM cartridge and CPD-N1 to the main unit, turn the power switch ON.</li> <li>3. Press (II) key of the CPD-N1, open the disc tray.</li> <li>4. Set the GGV1003 to the tray, then press the (I) key of CPD-N1, starts playback.</li> <li>5. Press the cross key (right) of CPD-N1 to scanning disc, then press the cross key (up) to still playback at the color bar (#5,401).</li> <li>6. Adjust VR804 so that color phases of each color bar of LD disc and of cartridge are the same.</li> </ol> <p>Note : Frame No. does not appear on the display when the adjustment ROM cartridge is installed.</p>	

# 8. SYSTEM CONTROL DESCRIPTION

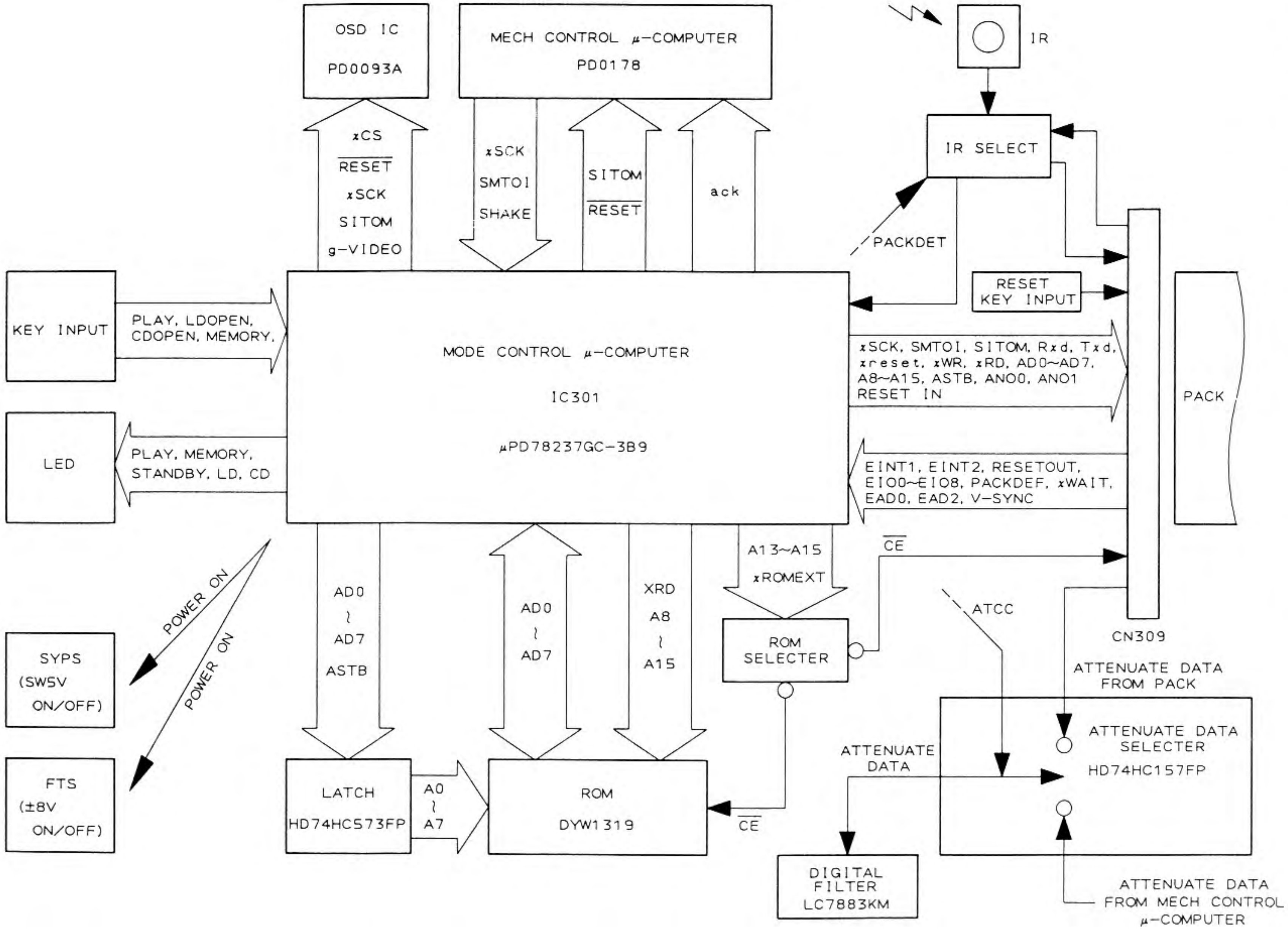


Fig. 8-1 Block diagram of control section

## 8.1 MICROCOMPUTER INTERFACE

The microcomputer system of this model consists of two chips, an 8-bit microcomputer (IC201 : PD0178) which controls the mechanism and a 4-bit microcomputer (IC301 :  $\mu$ PD78237GC - 3B9) which controls the operations and displays.

These two microcomputers are connected via a serial interface. The communication lines are also used for controlling the character generator IC (IC807 : PD0093A).

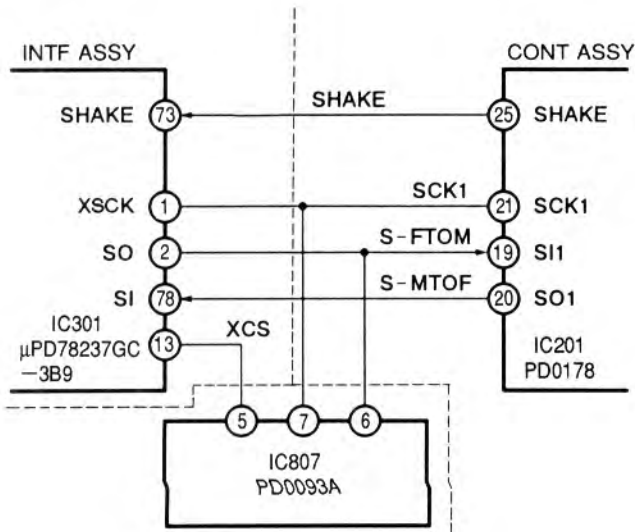


Fig. 8-2 Serial interface connection

## 8.2 MICROCOMPUTER COMMUNICATION SEQUENCE

1. The PD0178 sets the SHAKE terminal (pin25) to "L" for several microseconds as a request to the  $\mu$ PD78237GC - 3B9 for the start of a communication.
2. When the  $\mu$ PD78237GC - 3B9 receives the communication start request, it sets the SHAKE terminal (pin73) to "L" and informs the PD0178 that it is ready for communication.
3. The PD0178 then sets SCK1 (pin21), which has been used as an input port, to output mode. The  $\mu$ PD78237GC - 3B9 sets XSCK (pin1) to the input mode, connecting the communication lines between the microcomputers.
4. The PD0178 sends the transfer clock (500KHz) in 8bits. The data are then sent and received in synchronization with this clock.
5. When  $\mu$ PD78237GC - 3B9 receives data of 8 bits, it sets the SHAKE terminal (pin73) to "H" and reports that a single communication is completed.
6. The PD0178 sets SCK1 (pin21) to input mode, and the  $\mu$ PD 78237GC - 3B9 sets XSCK (pin1) to output mode. The communication line is thereby disconnected and a single communication is completed.

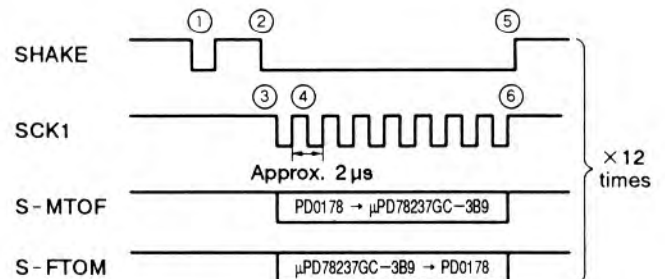


Fig. 8-3 Timing chart of the microcomputer interface

- The communication takes place within a cycle between 10 and 30ms. Twelve bytes of data are transmitted at one time.
- The handshake is done on a single line. Both the PD0178 and the  $\mu$ PD78237GC - 3B9 use a single port for both input and output. The port is set to output mode when the output is "L". In other conditions, it will be set to input mode (high impedance). Before "L" is output, both ports mutually confirm that the SHAKE terminal is "H". This is to prevent signal interference between tray output signals.
- The communication data is appended with a check code to prevent transfer errors. If sixteen consecutive transfer errors are detected, the  $\mu$ PD78237GC - 3B9 will send the reset signal to the PD0178 to reset it to its initial state. This will also happen when the communication is not executed for 300ms or longer.

### 8.3 OUTLINE OF THE MECHANISM CONTROL SYSTEM

#### 1) Processing immediately after power ON

When power is applied, the mechanism – control microcomputer (IC201 : PD0178) will execute initialization in the following sequence upon reset cancellation (pin28 : L to H).

1. The internal RAM and ports are initialized.
  2. The CXD2500BQ is initialized.
  3. The tray position is detected.
  4. The FTS – IC PM3003 is initialized.
  5. The TBC – IC PDB011 is initialized.
  6. Communication with the  $\mu$ PD78237GC – 3B9 is confirmed.  
(If any trouble is found, the subsequent initialization procedures will not be performed.)
  7. The pickup position is initialized.
  8. Disc rotation stops.
  9. Loading mode is initialized.
- After all the initialization procedures are completed, normal operations can begin.

#### 2) Control of the loading motor

Driving of the loading motor is controlled by a PWM signal supplied from pin18 of the mechanism – control CPU (IC201) in the CONT Assembly. The voltage applied to the loading motor is switched according to the duty of the PWM signal as follows. The PWM cycle is approximately 910 $\mu$ sec.

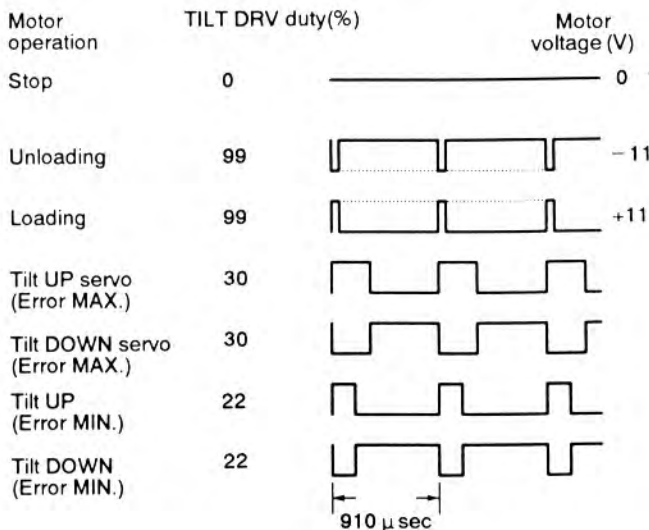


Fig. 8-4

#### ● Loading/clamp operation

For the disc tray open/close and disc clamp and stop operations, the motor is operated while the position of the cam gear is detected by the loading/tilt – position detection switch connected to pins33 through 35 of the PD0178.

#### ● Tilt servo operation

When an LD disc or a CDV disc (video portion) is played back and when a CDV disc is started up, the loading motor is used for the tilt servo. The loading motor is driven by a PWM drive in this mode as well.

The tilt servo operates the loading motor so that the input voltage at pin9 (TILT ERR) of the PD0178 becomes 2.5 V. The tilt servo operates in the following ranges during normal playback.

CAV disc	(12-inch)	: Frames 0 – 40999
	(8-inch)	: Frames 0 – 16999
CLV disc	(12-inch)	: 0 min. – 44 min. 59 sec.
	(8-inch)	: 0 min. – 13 min. 59 sec.
CDV disc	(video portion)	: 0 min. 0 sec. –
		(Recording time – 1 min. 23 sec.)
CD disc		: The tilt servo is ON only at start-up.

If some trouble occurs with the disc or tilt sensor circuit which prevents the input voltage at the TILT terminal from being within the specified range even if the pickup inclines to more than  $\pm 2^\circ$  (degrees), the loading motor will be stopped upon detection of the state of the mechanism switch.

The tilt servo switches the duty of the PWM signal in 2 levels according to the error value. When the error value is small (1.25V – 3.75V), a PWM signal for small duty 22% is output, and when the error value is large (0V – 1.25V, 3.75 – 5V), a PWM signal for large duty 30% is output. (See Fig. 8-4)

#### ● Auto Tracking Balance Operation

##### AUTO TRKG BAL Control (ATB)

ATB can start only after the disc makes one rotation. Sampling is done for 300msec (150 rotations) and the corresponding PWM is set. The PWM set in the end is calculated from the total of 8 rotations from 142nd to 149th rotation. In the test mode during tracking open, the count starts (from 140) after the tracking closes when the current rotation is deemed to be the 140th. The PWM is calculated from the total of 8 rotations from the 142nd to the 149th one. During TRK open, the tracking error signal which is output from CXA1081S (IC801, pin 20) is detected respectively by the upper and lower sides and added. The tracking balance error signal is thereby obtained. After undergoing equalizing and level conversion, the error signal is input to IC101 pin8 as TBAL ERR. Based on this error, the duty pulse is output from IC101 pin12 and smoothed. Then it is supplied to IC801 pin11 input TRK C so that the tracking balance becomes 0V center. Each time a disc starts up, the tracking balance is obtained during the tracking open period. The corresponding voltage is held thereafter. The auto tracking balance is set to operate constantly during the test mode tracking open.

3) Slider motor control

The mechanism control IC controls the drive signal output from pin20 of the FTS servo IC by the serial command.

The voltage applied to the slider motor is switched according to the duty of the PWM signal as follows. The PWM cycle is 36mS.

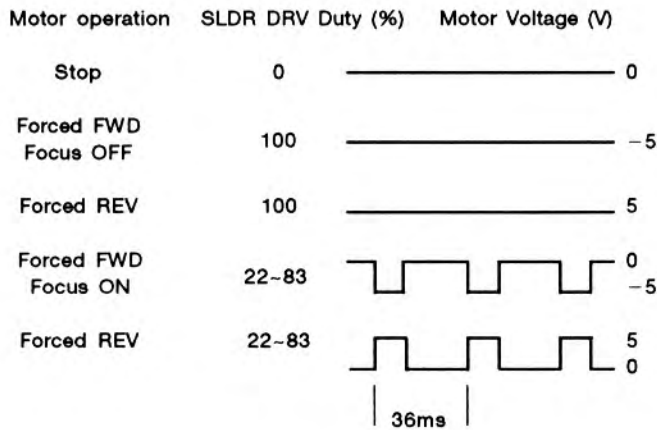


Fig. 8-5

4) Audio control

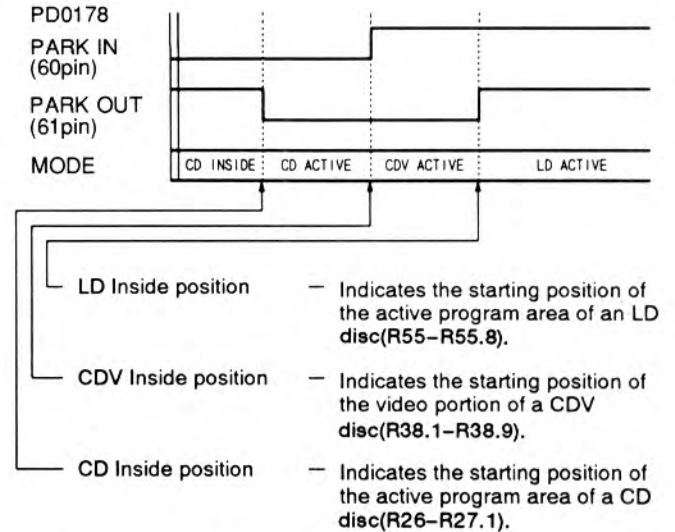
Digital audio channel switching is performed by the CXD2500BQ by using a command from the microcomputer.

DIGITAL 45	SQ1 14	SQ2 13	L - ch Line Out	R - ch Line Out
L	L	L	Analog L ch	Analog R ch
	H	L	Analog L ch	Analog L ch
	L	H	Analog R ch	Analog R ch
	H	H	Mute	Mute
H	L	L	Digital L ch	Digital R ch
			Digital L ch	Digital L ch
			Digital R ch	Digital R ch
			Digital - 12dB - L	Digital - 12dB - L

Table. 8-1

● SLDR POSITION

\* The following positions can be detected by using two switches in combination.



R: The distance from the center of the spindle motor.

Fig. 8-6

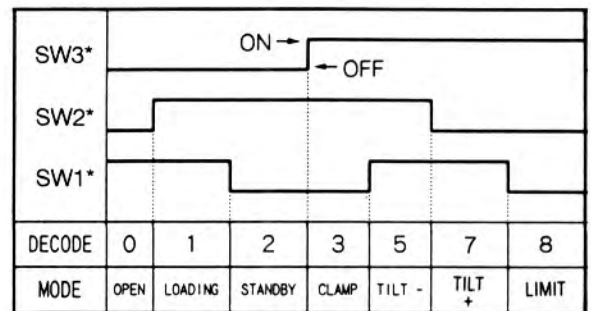


Fig. 8-7 LOADING/TILT POSITION

**5) CLV Clear Scan**

Clear scan without picture distortion is possible also for CLV discs by using the shuttle ring (either on the player or the remote control unit).

The conventional color-lock scan and the clear scan can be switched depending on the angle of the shuttle ring rotation. In a clear-scan operation, scanning is performed while outputting digital audio at -12 dB (the same as scanning on CD). (No audio is output when analog audio is selected.)

The principle of the operation is as follows.

1. When clear scan mode is activated, the specified number of tracks is skipped in a multi-track jump operation.
2. Measures the time lag (phase difference) between PB - V and REF - V and when the measured value is within a certain range, decreases REF - H by 7 H until the phase difference between PB - V and REF - V is lost (VLOCK), then cancels squelch, displaying the video portion of the disc for a certain period. Returns to step 1 and repeats steps 1 and 2.

When the time lag between PB - V and REF - V exceeds a certain range, performs a 1-track jump (2-track jump in the REV direction) and measures the lag again. When the measured value is within a certain range, decreases REF - H by 7 H waiting for VLOCK between PB - V and REF - V. Otherwise, repeats a 1-track jump and time-lag measurement.

If the time lag does not enter a certain range even after repeating the 1-track jump and time-lag measurement operation three times, a multi-track jump is performed for a larger skip and is repeated step 2 from the beginning. If the lag persists in not entering a certain range, VLOCK wait state is activated.

- \* Gray-background video is output when no disc video is supplied.
- \* Digital audio to be played during clear scan is output while the disc video is being supplied and in VLOCK wait state.
- \* For CAV discs, nearly the same operation is performed.
- \* PB - V (playback V) means V - sync of the playback video signal.
- \* REF - V (reference V) means V - sync used as the reference.
- \* VLOCK means the signal generated when the PB - V and REF - V are in a certain range.

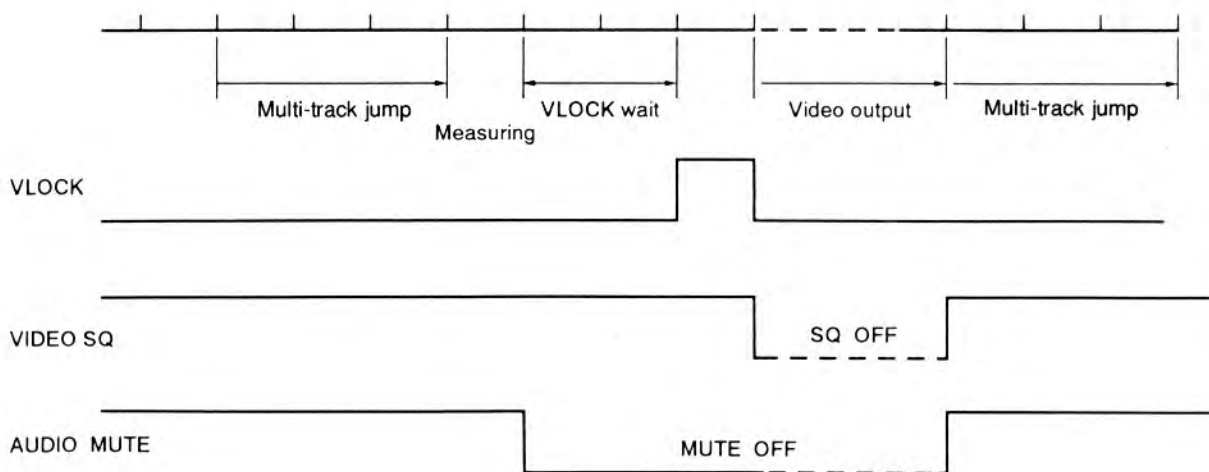
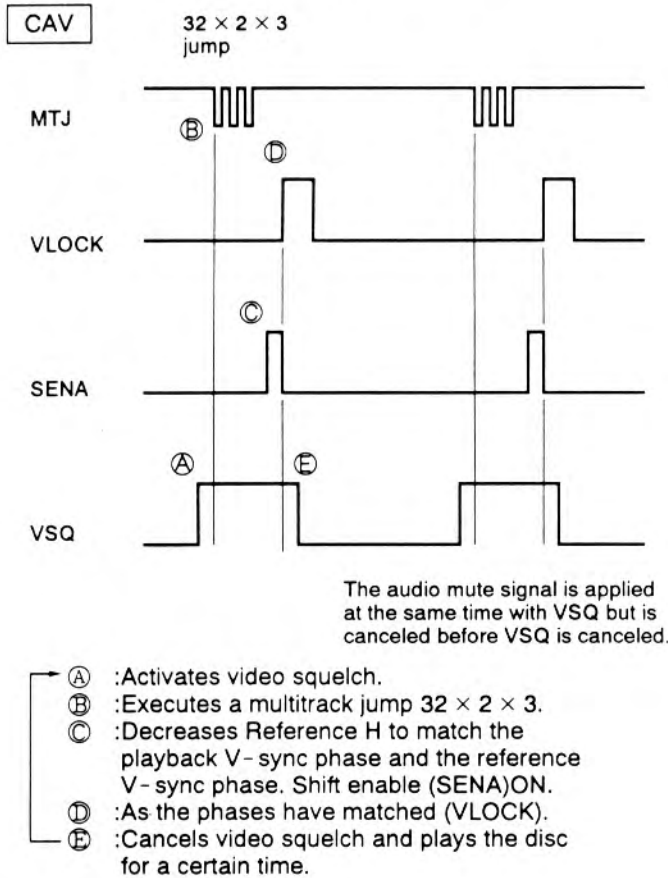


Fig. 8-8

● **Timing Chart of the Clear Scan**



**CLV**  
Compared with CAV, a longer time is required to match the phases after a jump operation. Ⓒ

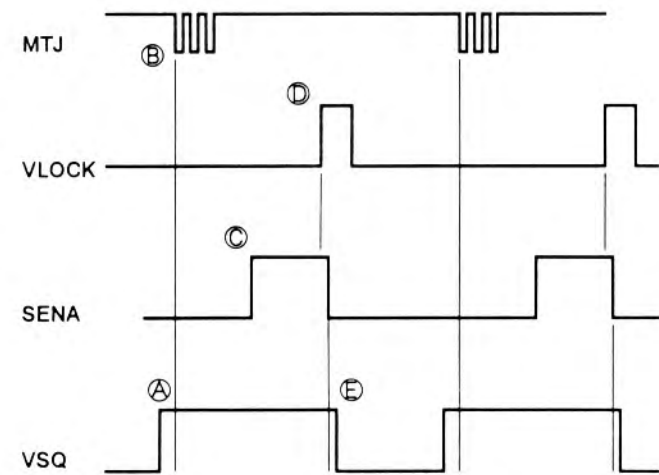


Fig. 8-9

● **Timing Chart of the Normal Scan**

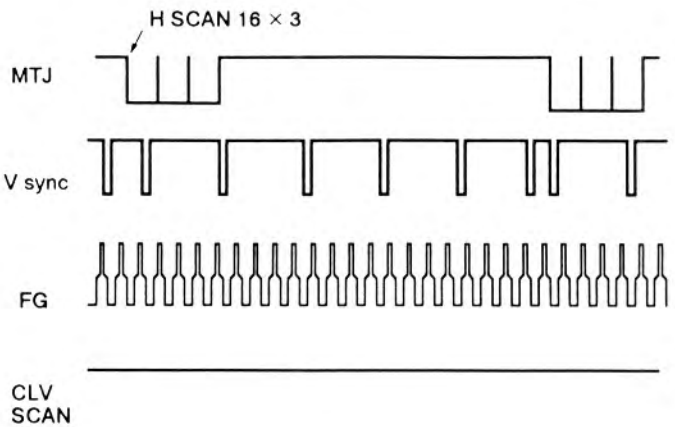
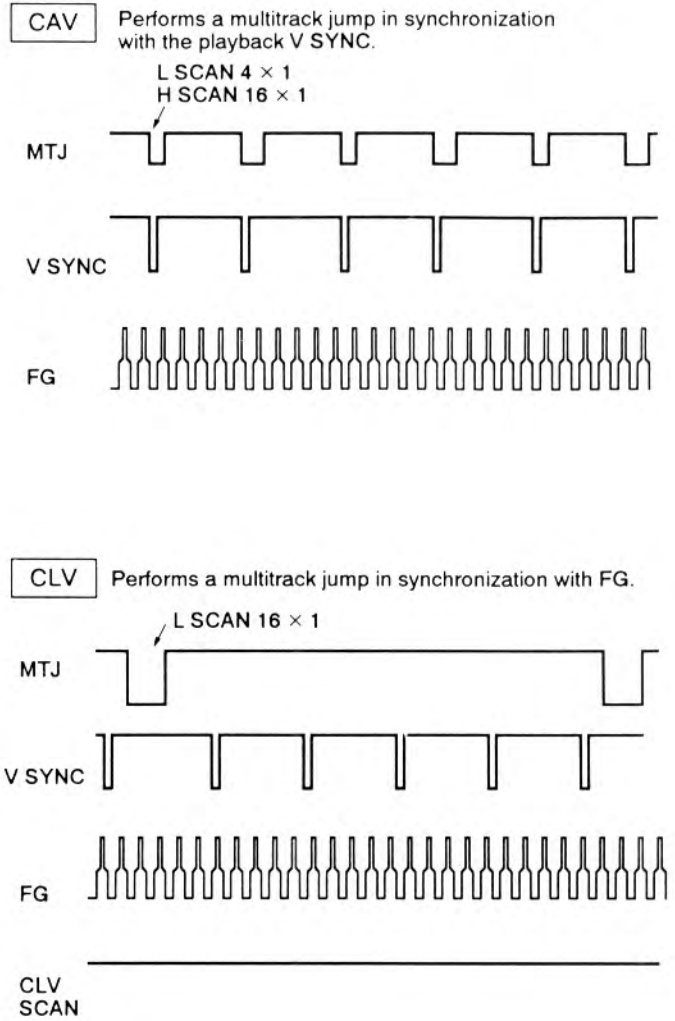
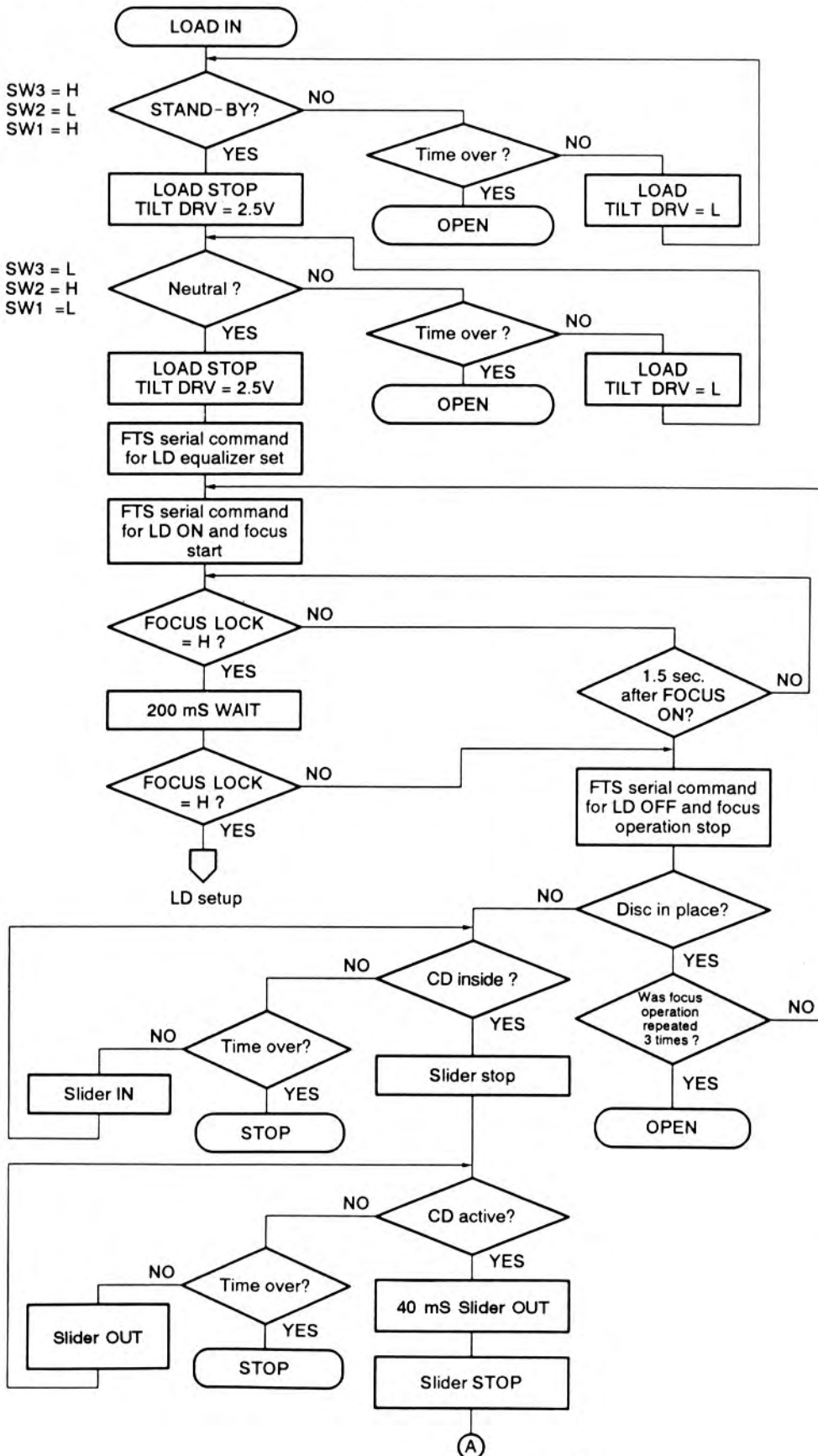


Fig. 8-10

### 8.4 FLOW CHARTS OF VARIOUS OPERATIONS

#### Flow from the tray-opening to tray-IN operations



- From the state that the tray is open to the completion of the tray-IN operation.

- If the loading operation does not enter the stand-by position with in five seconds, it is judged as an abnormal condition, and the tray opens.

- Clamp operation  
Timer = 10 seconds

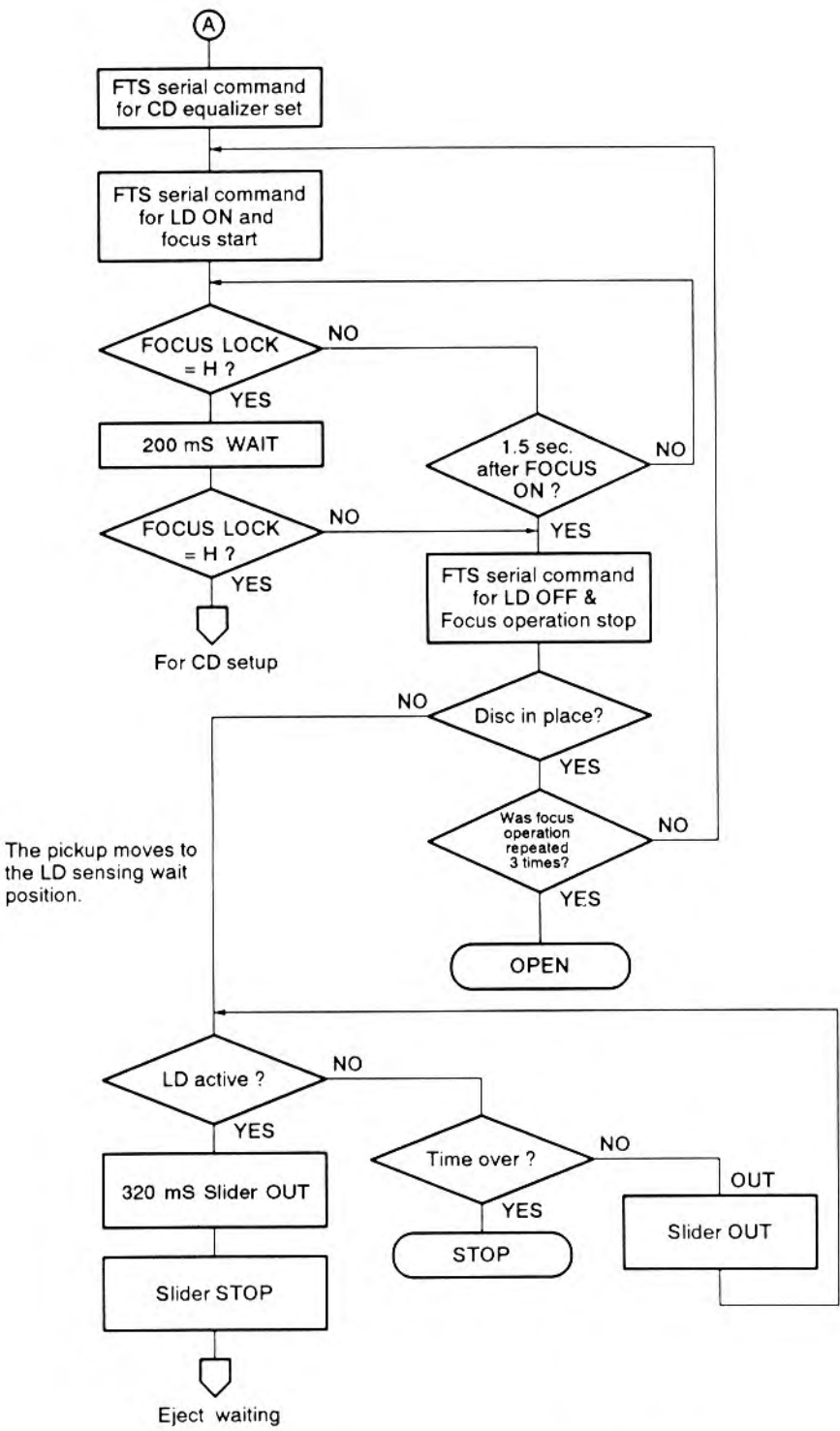
- Pickup position in LD focusing ≈ around R65  
R:Distance from the center of the spindle motor.

- Judged as "Disc in place" when FOCUS LOCK becomes "L" during focus sweeping.
- If the focus is not locked even if focus sweeping is repeated three times with the disc in place, the tray opens, judging it to be an abnormal condition.
- Slider operation limit timer ≈ approx. 10 seconds.

- If the slider operation is not completed within a certain time, the operation stops and any key other than OPEN is not accepted.

Fig. 8-11



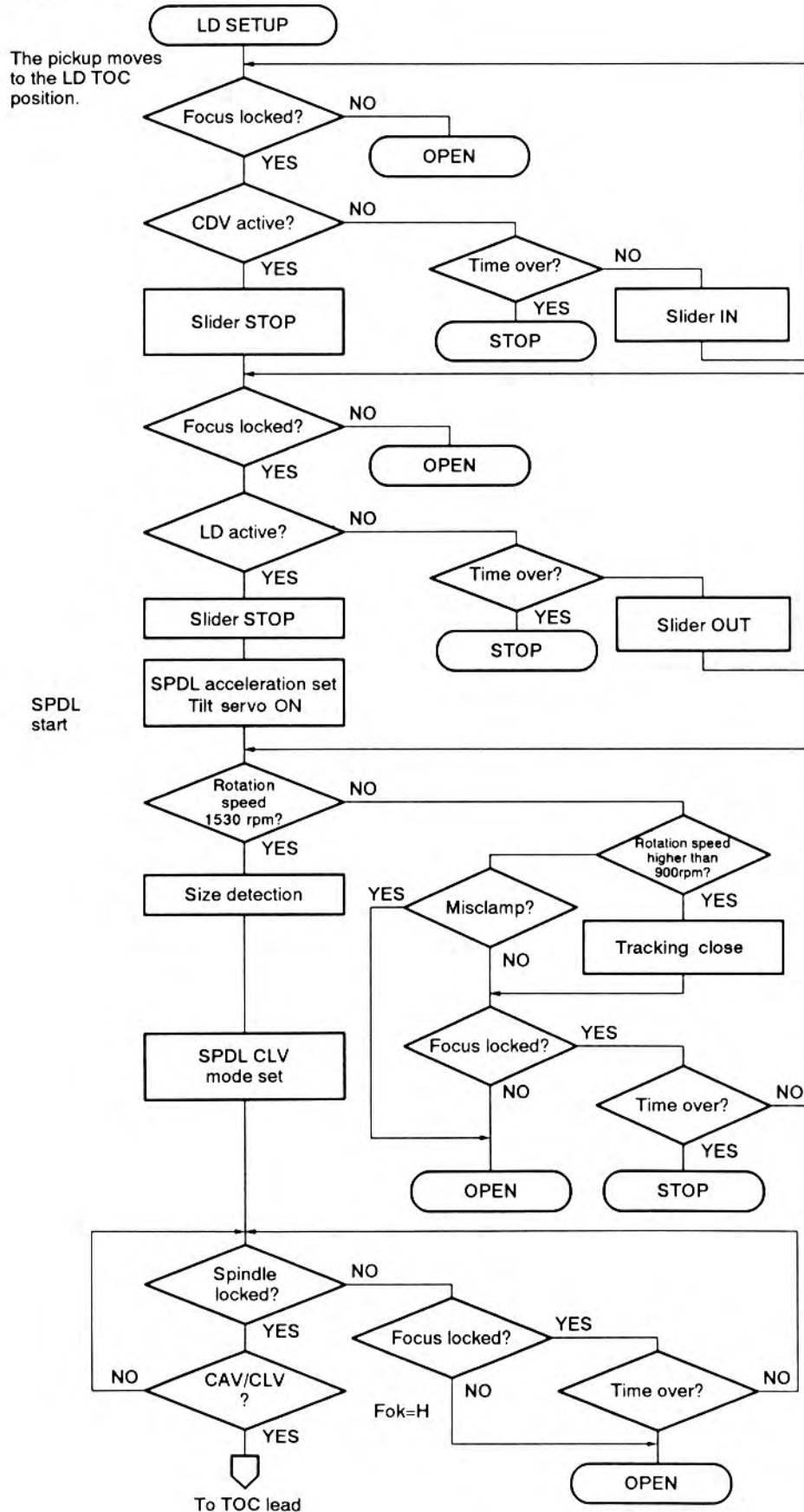


- Pickup position for CD focusing = R30
- CD focusing is the same as LD focusing.
- R:Distance from the center of the spindle motor.

- R65, the LD sensing position  
R:Distance from the center of the spindle motor.
- Timer for 10 seconds  
Timer indicates the time over.

Fig. 8-12

Flow of the LD Setup Operation



• If focus is lost while the pickup is moving to the spindle startup position, the tray opens, judging it to be CD and LD disc-stacking error.

• Timer for approx. 10 seconds  
Timer indicates the time over.

• Timer for approx. 10 seconds.

• Tracking servo open mode is active until disc rotation exceeds 900 rpm.

• The disc rotation is forcibly accelerated until it reaches 1530 rpm, and the disc size is determined by the time required to reach 1200rpm.

• If 800 or more tracks are crossed in a single rotation of the disc, the tray opens, regarding it to be a misclamp.

• If focus is lost during the startup operation, the tray opens, assuming a damaged disc or the flip side of a single-sided disc.

• If the spindle is not locked within 60 seconds after beginning SPDL acceleration, the operation stops.

Fig. 8-13

● **Player Operation Modes**

**MODE 1 — OPEN**

Step	Operation			
0	Clears internal registers, sets the spindle to STOP and waits for focus OFF.			
1	Double side		Single side	
	Side B	Side A	During $\alpha$ -turn	
	Starts tilt up		Starts tilt down	
2	Wait for tilt up. Starts to move the slider B to the out side.			
3	Waits for the spindle to stop.			
4	Waits for the slider B to move the out side.			
5	Starts clamp switching (B to A).			
6	Waits for clamp switching (B to A).			
7	Starts tilt down.			
8	Wait for tilt down			
9	Starts to move the slider to the LD sensing position.			
A	Waits for the spindle to stop.			
B	Waits for the slider to reach the LD sensing position.			
C	Starts unloading.			
D	Performs unloading until the OUT SW activates.			
E	Sets the 100 ms timer.			
F	Waits for 100 ms.			
10	Sets the OPEN mode.			
	Completed			

**MODE 3 — STOP**

Step	Operation			
0	Clears internal registers, sets the spindle to STOP and waits for focus OFF.			
1	Double side		Single side	
	Side B	Side A	During $\alpha$ -turn	
	Starts tilt up		Starts tilt down	
2	Wait for tilt up. Starts to move the slider B to the out side.			
3	Waits for the spindle to stop.			
4	Waits for the slider B to move the out side.			
5	Starts clamp switching (B to A).			
6	Waits for clamp switching (B to A).			
7	Starts tilt down.			
8	Wait for tilt down			
9	Starts to move the slider to the LD sensing position.			
A	Waits for the spindle to stop.			
B	Waits for the slider to reach the LD sensing position.			
C	Starts to move the tilt to the neutral position.			
D	↓			
E	Waits for the tilt to reach the neutral position.			
	Completed			

**MODE 2 — STANDBY**

Step	Operation			
0	Clears internal registers, sets the spindle to STOP and waits for focus OFF.			
1	Double side		Single side	
	Side B	Side A	During $\alpha$ -turn	
	Starts tilt up		Starts tilt down	
2	Wait for tilt up. Starts to move the slider B to the out side.			
3	Waits for the spindle to stop.			
4	Waits for the slider B to move the out side.			
5	Starts clamp switching (B to A).			
6	Waits for clamp switching (B to A).			
7	Starts tilt down.			
8	Wait for tilt down			
9	Starts to move the slider to the LD sensing position.			
A	Waits for the spindle to stop.			
B	Waits for the slider to reach the LD sensing position.			
C	Starts to move the tilt to the neutral position.			
D	Waits for the tilt to reach the neutral position.			
	Completed			

**MODE 4 — DISC SENSING**

Step	Operation	
0	Waits for the tilt to be neutral.	
	Single side	Double side
		Side A      Side B
	Normal	CD direct mode
	LD sensing	CD sensing
1	Starts to move the slider to the LD sensing position. Clears the focus-try counter.	
2	Waits until the slider reaches the LD sensing position.	
3	Tries focusing.	
	Focus unlocked	Focus locked.
		LD presence assured. Completed.
4	Focus OFF	
5	Starts to move the slider to the CD sensing position.	
6	Waits until the slider reaches the CD sensing position.	
7	Tries focusing.	
	Focus unlocked.	Focus locked.
		CD presence assured. Completed.
8	Focus OFF	
9	Starts to move the slider to the LD sensing position. Clears the focus-try counter.	
A	Starts to move the slider to the LD sensing position.	
B	Checks for CD direct mode.	
	CD direct mode	Normal
C	Tries focusing.	
	Focus unlocked	Focus locked
		LD presence assured. Completed.
D	Focus OFF	
E	No disc assured. Completed.	
F	Starts to move the slider to the B inside position.	
10	Waits until the slider reaches to the B inside position.	
11	Tries focusing.	
	Focus unlocked	Focus locked
12	Focus OFF	B side presence assured. Completed.
13	No B side assured.	
	Completed.	

**MODE 5 — SETUP**

Step	Operation		
0	Waits for the tilt to be neutral. Sets the slider target position.		
	CD	LD Side A	LD Side B
	Starts to move the slider to the CD TOC position.	Starts to move the slider to the LD TOC position.	Starts to move the slider to the LD B inside position.
1	Check focus. Simultaneously checks for disc stacking (LD + CD)		
	Focus locked (OK)		Focus unlocked (NG)
	Waits until the slider reaches the target position.	LD	CD
		Ends with the focus error status.	Ends with the focus error after three unsuccessful tries.
2	Sets the spindle.		
	CD set	CDV set	LD set
	Sets the 60-second timer. Starts to run the spindle.		
3	Checks focus.		
	Focus locked (OK)		Focus unlocked (NG)
	Waits until the spindle locks while checking for misclamping.	Time over. Ends with the spindle error status.	Ends with the clamping error status.
	Sets the 60-second timer.		
4	LD		CD, CDV
	Distinguishes CAV/CLV		
	Not distinguished	Distinguished	
5	Checks focus.		
	Focus locked (OK)		Focus unlocked (NG)
	Waits the codes to be read.	Time over.	Ends with the focus error.
	Slowly moves the slider to the inner or outer periphery until the PGM area code is read. After reading the code, sets the 60-second timer and returns to step 4.	Ends with the code error.	
6	Completed.		

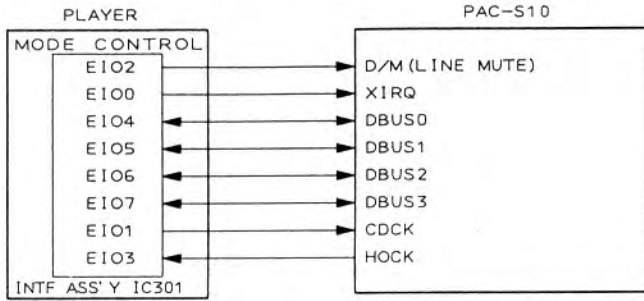
**MODE 6 — TOC READ**

Step	Operation		
0	Diverges depending on the disc type.		
	LD	CD, CDV	
1	Clears 1st address. Sets the 15-second timer.		
	Moves to the lead-in area and checks the focus time.		
	A 24-bit code read.	Not read	
↓	Lead-in area	PGM area, lead-out area.	
	↓	32-track REV jump	Playback
2	Moves to the PGM area and checks the focus time.		
	A 24-bit code read.		Not read
	PGM area	Lead-in area	
↓	16-track FWD jump	Playback	
	Moves to the lead-in area and checks the focus time.		
3	A 24-bit code read.		Not read
	Lead-in area	PGM area	
	↓	4-track REV jump	Playback
4	Plays to the PGM area and checks the focus time.		
	A 24-bit code read.		Not read
	PGM area	Lead-in	
5	Sets the 0.5-second timer.		Playback
	Stores the 1st address (CH, time) in memory and checks the focus time.		
	After 0.5 seconds, checks for the CH and the seconds.		
6	Sets the 0.5-second timer ↓		
	Checks for TOC (subcodes) and checks the focus time.		
	TOC available ↓	Ends with no TOC if no subcode can be read in 0.5 seconds.	
7	Sets the 15-second timer.		
8	Waits until TOC is read.		Time over.
	PGM area	Lead-in area. Subcode NG.	TOC reading completed.
↓	Playback		Ends.
	Subcode OK and focus check NG.		
9	32-track REV jump		Playback
	Subcode OK and focus check NG.		
A	32-track REV jump		Playback
	Subcode OK and focus check NG.		
B	32-track REV jump		Playback
	Subcode OK and focus check NG.		
C	32-track REV jump		Playback
	Returns to step 8.		
E	Starts to move the PGM area. CD-R identified.		
F	CD-R backup Move to the PGM area. Confirmed.		
10	Ends with the code error.	Time over. Ends with no TOC.	
11	Moves to the user code reading area.		
12	Checks user code.		

**MODE 8 — SEARCH**

Step	Operation	
	Focus ON	Focus OFF
0	Sets the 15-second timer	
	Ends with the recovery error.	
	Diverges depending on disc, search target or playing game.	
	CDV	CD, CAV, CLV
A→V V→A	A→A V→V	CD, CDV CAV frame search CLV time search (During game)
		CAV chapter search CLV chapter search CLV time search (Not during game)
1	Clears the focus-try counter and starts to the spindle STOP operation. Starts to move the slider.	
	To A→V CDV TOC position.	To V→A CD TOC position
2	Waits until the slider reaches the specified position.	
	Waits for spindle STOP. →Ends with the disc stack (clamp) error if the spindle does not stop in 1.6 seconds.	
	Focus locked (Sets the 15-seconds timer.)	Tries focusing.
3	Sets the spindle for CD audio.	Sets the spindle for CDV video.
	Ends with the recovery error after four unsuccessful tries.	
4	Waits until the spindle locks.	
	Waits until the subcode is read.	
5	If the disc is CDV, go to step 9..	
	Sets the 20-times track counter.	
6	Less than 256 track or CLV → step 6.	More than 256 track → step 5.
	Others → step 7.	
7	Performs track counter searching.	
	Less than 256 track → step 6.	CLV → step 7.
8	Performs multi-track jump searching.	
	When not playing game → step 9	Less than 32 track of CAV, performs 1-track jump searching.
9	Drives the slider to cross the target address. (CAV: High speed, Other: Mid speed)	
	Drives the slider to cross the target address. (Low speed)	
A	Performs 32-track jumps to cross the target address.	
B	Performs 4-track jumps to reach the front of the target address. Sets the timer and goes to step C	
C	Plays until the target address is reached.	
	CD, CDV-A	REV 1 jump
D	Spindle locked.	Unlocked
	Game	Not Game
E	REV 2 jump. Go step 10.	REV 1 jump. Go step E.
	Go to step B.	
F	Performs 4-track jumps to a point before the target address. Sets the timer and goes to step E.	
	Plays until the target address is reached.	
10	During game and except CD, sets REV 2-track jump and goes to step 10.	
	If another new search target is specified during search, waits the spindle to lock and returns to step 0.	
11	Plays until the target address is reached. Then, goes to step 11.	
	Time check NG → Ends with the search error.	
12	If the operation is lead-in search, backs 32-track and goes to step 12. If not, completed.	
	Performs 32-track back jump, goes to step 13.	
13	Lead-in area → Search completed.	
	PGM area → Returns to step 7 to start searching one more times.	

### 8.5 INTERFACE BETWEEN THE PLAYER AND PAC-S10 PLAYER



※ The mode controller receives commands from the PAC - S10.

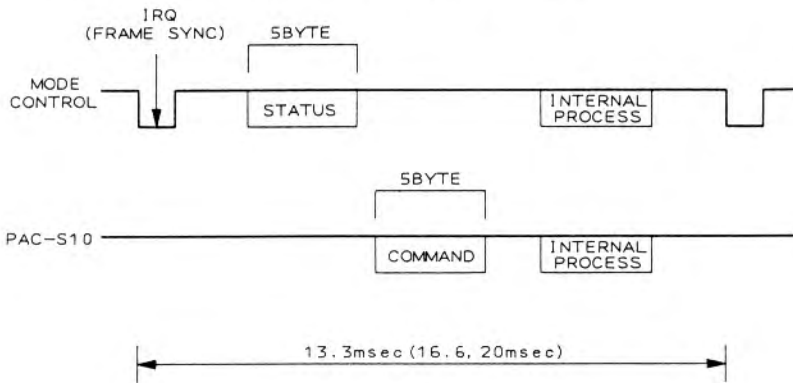
Fig. 8 - 14

#### <Mode Controller and PAC - S10 Communication Process>

As a data bus (DBUS 0 to 3), the communications board sends and receives 4-bit parallel signals. During CD playback, communications occur every 13.3msec according to the sync signal. During LD playback, it occurs every 16.6msec according to the sync signal. At other times, it occurs every 20msec (approx.) according to the mode controller's timer.

The 5 - byte (10 nibbles) data is sent according to the following process :

The general communications flow is shown below. (Fig 8 - 15)



#### <PLAYER and PAC-S10 COMMUNICATION TIMING>

DATA0~DATA9 : PLAYER MODE CONTROL→PAC-S10  
 DATA10~DATA19 : PAC-S10→PLAYER MODE CONTROL

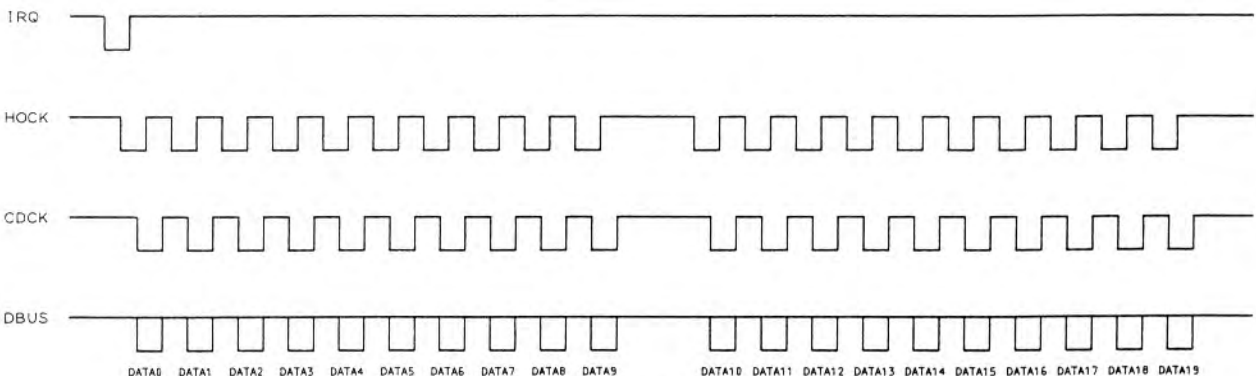


Fig. 8 - 15

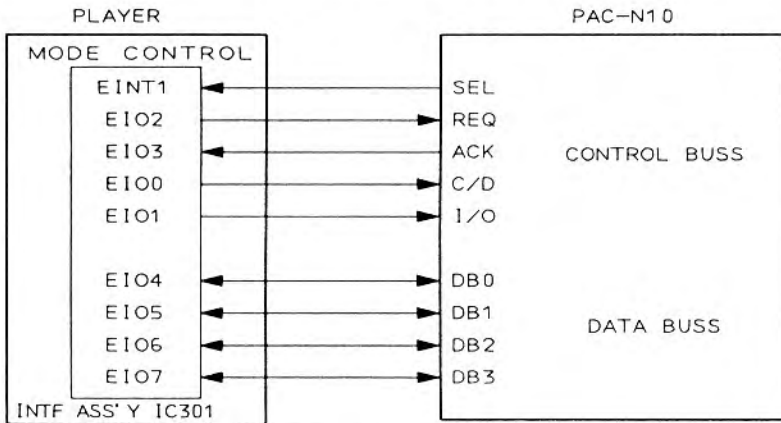
#### ① Mode Controller → PAC - S10

- Response to a command received from PAC - S10 in the preceding transmission.
- Current status (including errors) of the mode controller.
- Transmission of the player's current status (response to a report specification). Since the PAC - S10 monitors the status disclosed by the mode controller, the player operates as desired according to whether the issued command has been received or whether an error has occurred. Such information can be obtained.

#### ② PAC - S10 → Mode controller (1 nibble = 4 bits)

- Command which controls the player.
- Report specification which reports the player's status.

### 8.6 INTERFACE BETWEEN THE PLAYER AND PAC - N10



※The control bus is Low Active, and the data bus is High Active.

Fig. 8-16

The operating request from the PAC - N10 to the player starts with the SEL from PAC - N10.

When the player responds with REQ, PAC - N10 issues a 4 - byte command.

By giving a 1 - byte status to PAC - N10, the player completes a command operation.

Even while a command is still being executed, the player will issue a new command after receiving SEL from PAC - N10.

If this happens, the preceding status will be cleared entirely. Commands, data, status, etc., are transferred via the REQ/ACK handshake.

<PLAYER and PAC-N10 COMMUNICATION TIMING>

A command operation

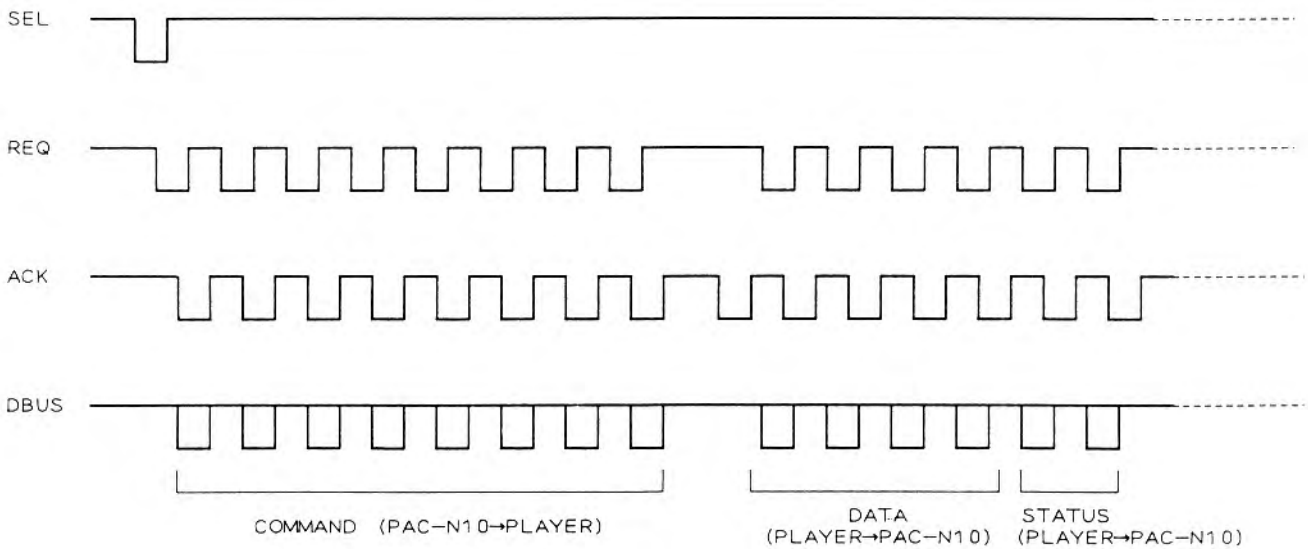


Fig. 8-17

8.7 INTERFACE BETWEEN THE PLAYER AND PAC-K1

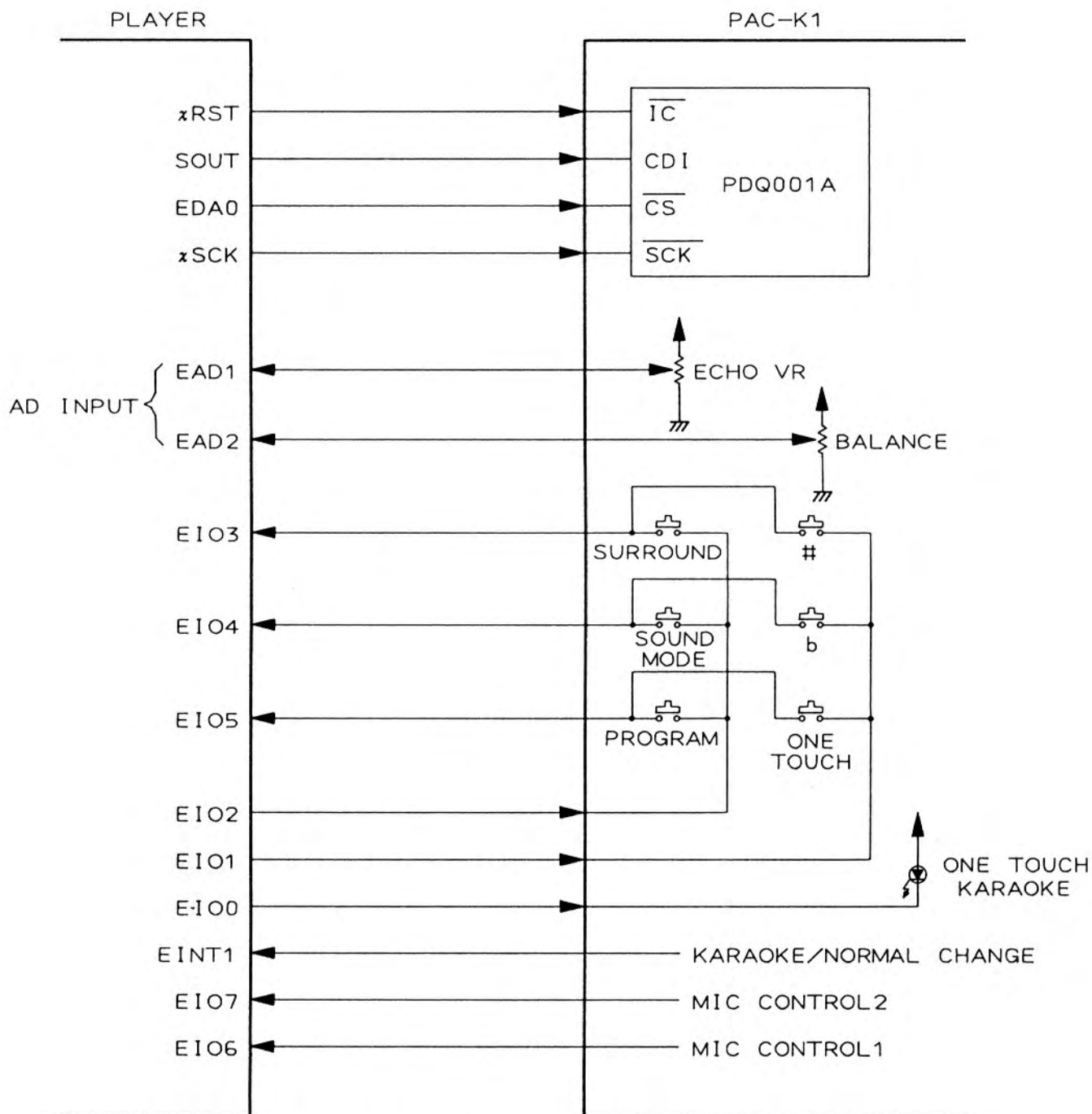


Fig. 8-18



• Microcomputer interface timing chart

a. For address in \$0000 to \$0005

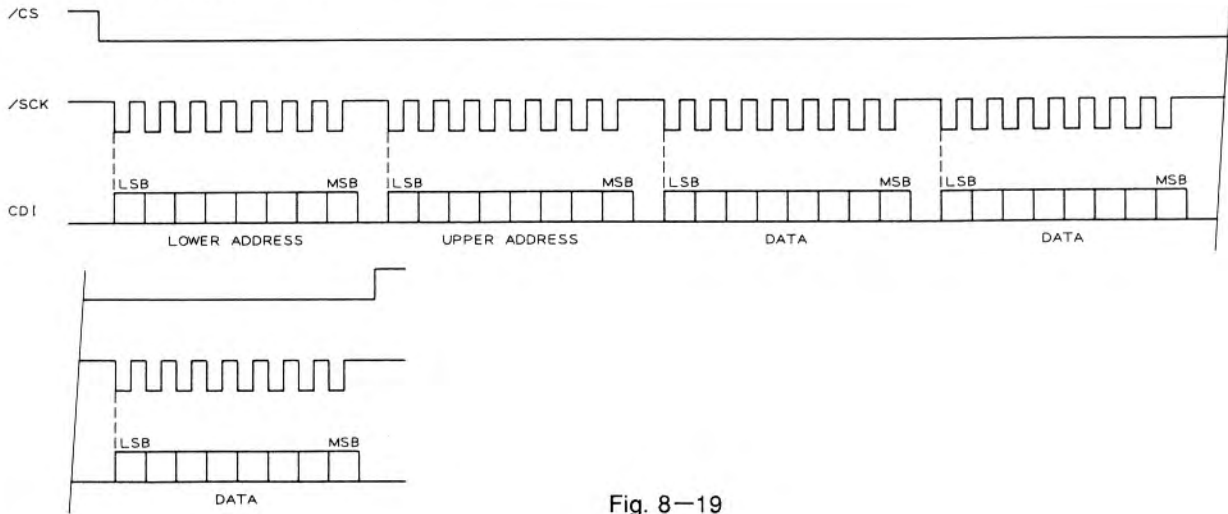


Fig. 8-19

b. For addresses starting from \$0040

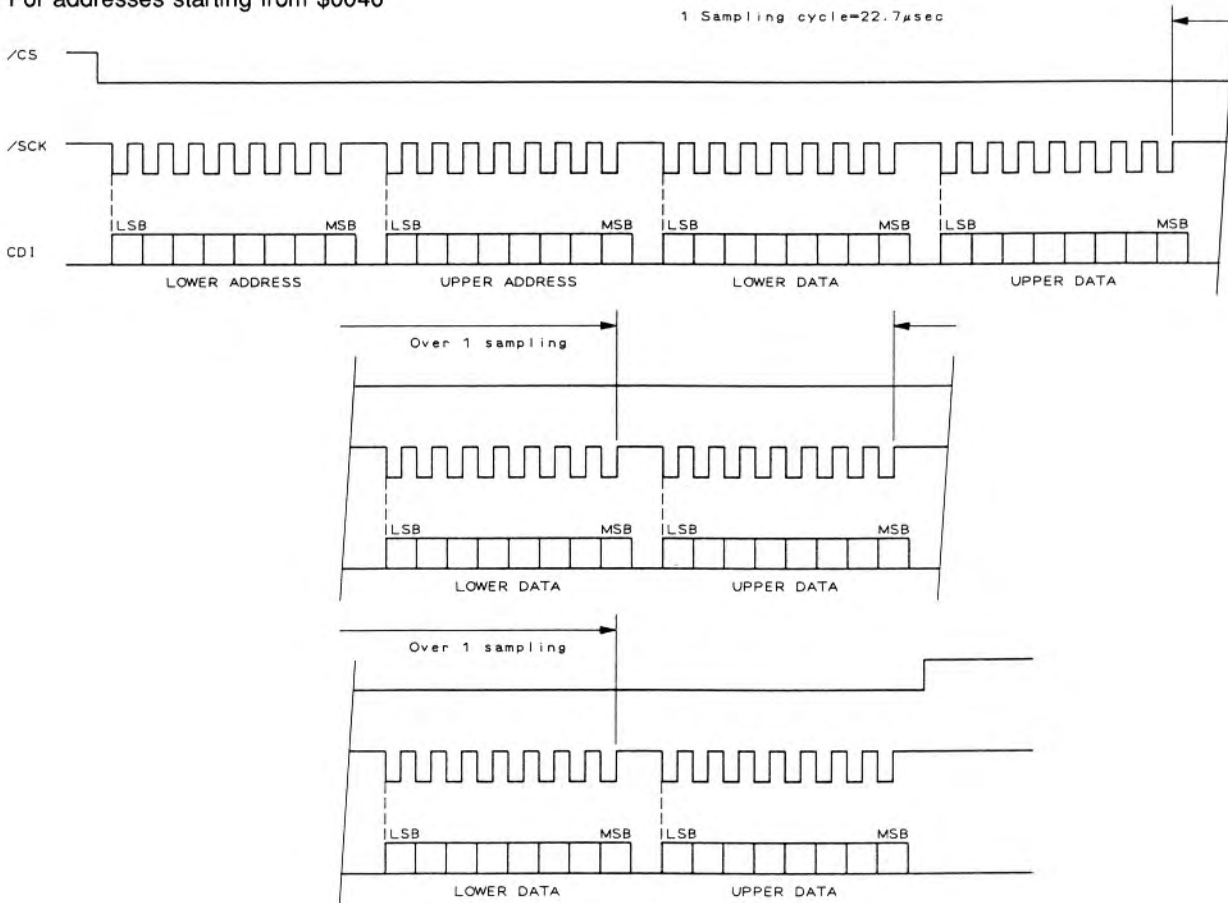


Fig. 8-20

The parameters for the DSP's resistor are set by sending the addresses and data.

After /CS is set to "L" the resistor's address is set for the first and second byte, and the data is set for the third byte and thereafter. The third byte's data is sent to the resistor that was set with the first and second bytes. The fourth byte's data is

sent to the resistor whose address is one above (plus one) the address of the resistor set with the first and second bytes.

For each byte of data sent, the address of the resistor set with the first and second bytes will be incremented.

Therefore, continuous addresses can be set just by sending the data. After the setting is completed, /CS will become "H."

c. Data transmission to non-continuous addresses

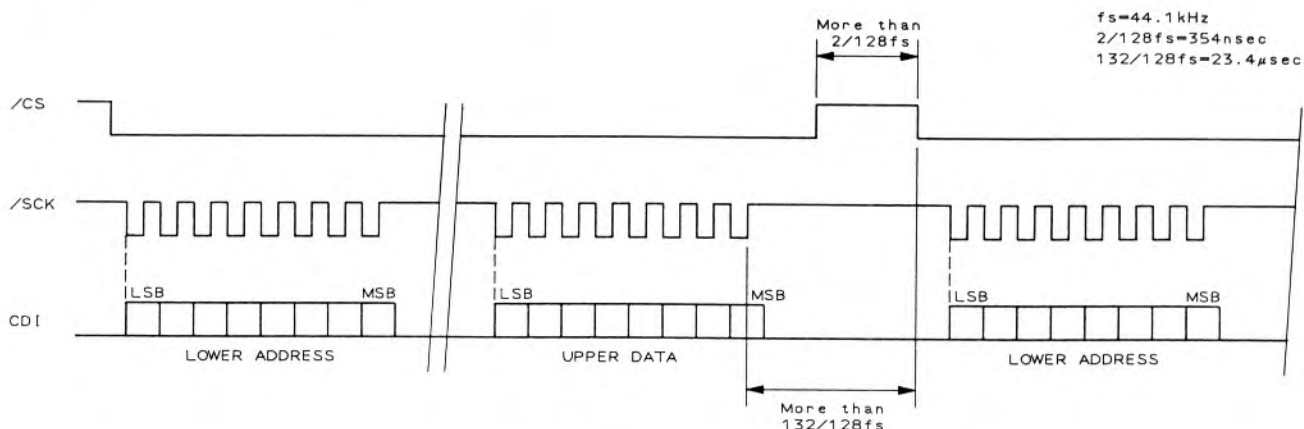


Fig. 8-21

When data is sent to non-continuous addresses, the timing shown in Fig. 8-21 above will take effect.

d. /IC terminals "L" period required for initial clearing

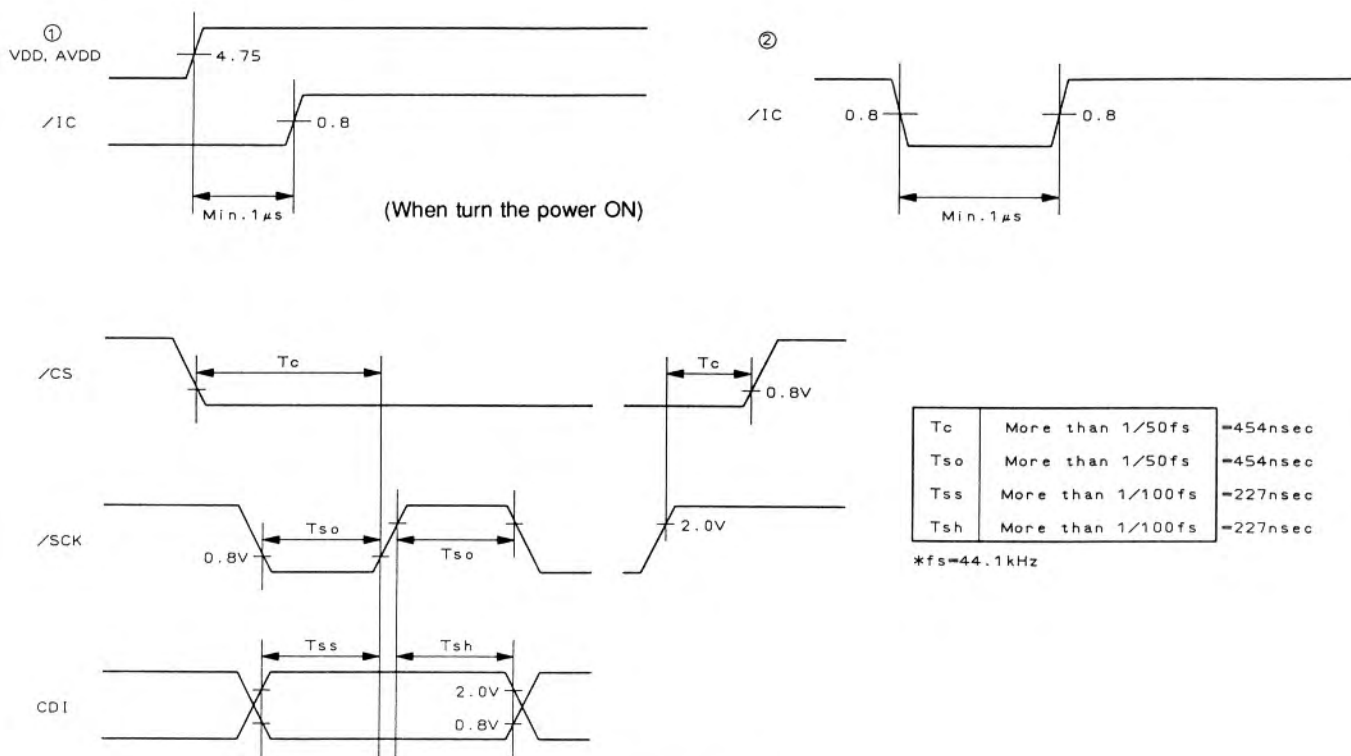


Fig. 8-22

### 8.8 PACK IDENTIFICATION FLOWCHART

· POWER OFF → POWER ON → PACK IDENTIFICATION

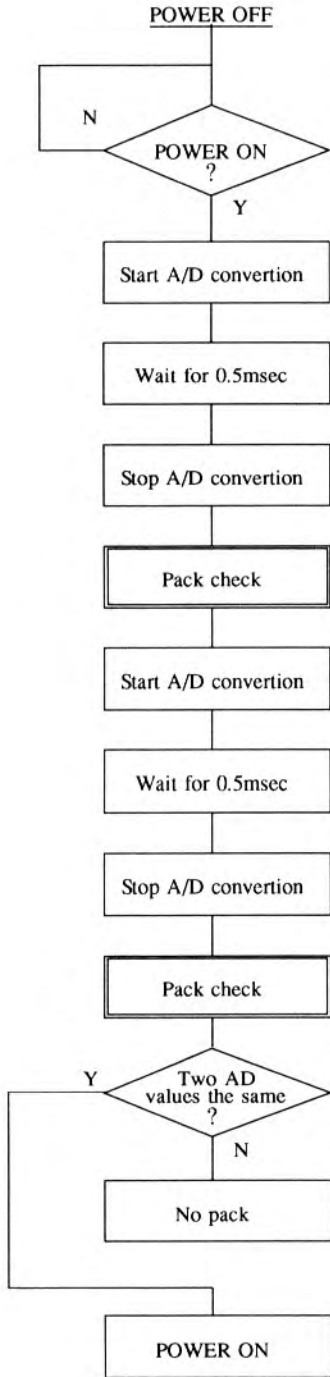
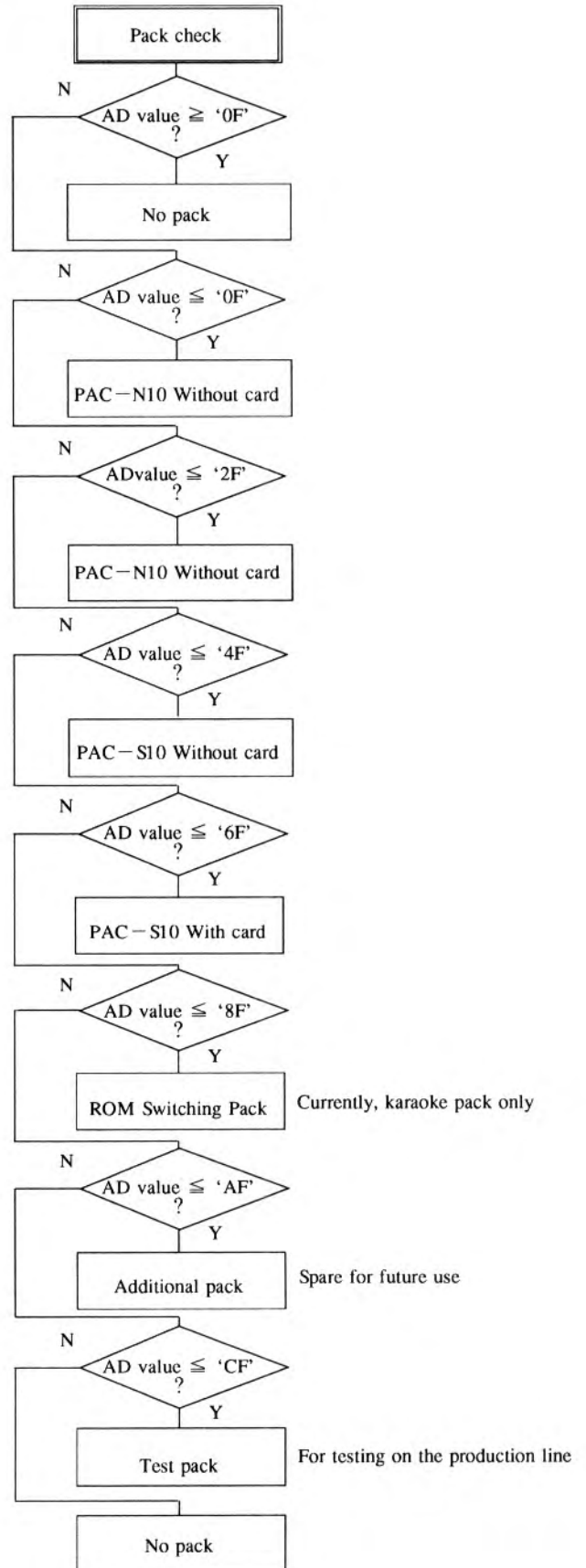


Fig. 8-23



Currently, karaoke pack only

Spare for future use

For testing on the production line

Fig. 8-24

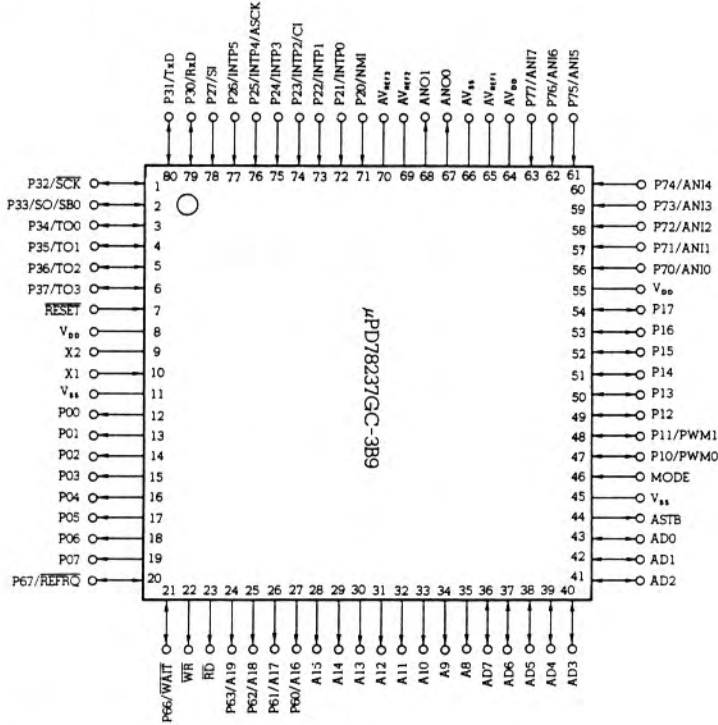
# 9. IC INFORMATION

- The information shown in the list is basic information and may not correspond exactly to that shown in the schematic diagrams.

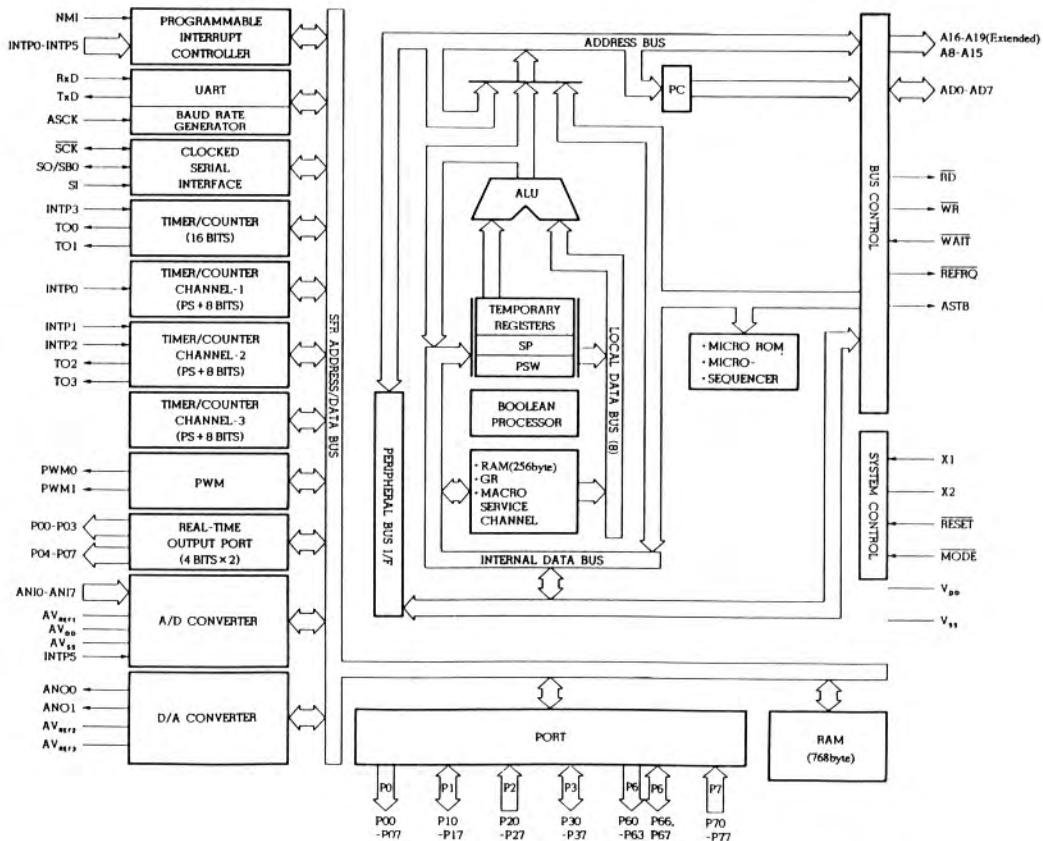
## ■ μPD78237GC-3B9 (INTF ASS'Y IC301)

### ● Mode control IC

#### ● Pin Assignment (Top view)



#### ● Block Diagram



## ● Pin Function

No.	Pin name	I/O	Function
1	XSCK	I/O	Serial communication clock
2	SO	O	Serial communication transmission data
3	GVIDEO	O	Switching game display only or LD and game display overlay H : Game only L : Overlay
4	N.C.	I	Not used
5	EIO 8	I	Detect pack category H : Normal L : Not defined
6	XROMEXT	O	Select Mode control ROM H : Main unit L : Inside Pack
7	XRESET	I	Reset input
8	VDD	-	Standard power supply
9	X2	-	System clock
10	X1	I	
11	Vss	-	GND
12	W.D.F	O	Pulse output for watchdog timer
13	XCS	O	Character generator chip select
14	XRESETO	O	Reset output
15	POWER ON	O	Switched 5V ON/OFF H : ON L : OFF
16	LED 0	O	PLAY LED drive output
17	LED 1	O	MEMORY LED drive output
18	LED 2	O	STANDBY/POWER LED drive output
19	LED 3	O	LD LED drive output
20	ACK	I/O	Communication handshake timing clock with mechanism control
21	XWAIT	I	Read/Write wait timing clock with external memory
22	XWR	O	Write strobe with external memory
23	XRD	O	Read strobe with external memory
24	PACKDET	O	Pack detect H : with Pack L : without Pack
25	SEGAMUTE	O	Digital audio mute (When CD - ROM game of PAC - S10 only) H : Mute
26	LED 4	O	CD LED drive output
27	ATCC	O	Switch digital filter attenuate control (Used with SEGA MUTE) H : Controlled by Mechanism control L : Controlled by Pack
28	A 15	O	Address line for external memory access
29	A 14	O	
30	A 13	O	
31	A 12	O	
32	A 11	O	
33	A 10	O	
34	A 9	O	
35	A 8	O	Address data line for external memory access
36	AD 7	I/O	
37	AD 6	I/O	
38	AD 5	I/O	
39	AD 4	I/O	
40	AD 3	I/O	
41	AD 2	I/O	
42	AD 1	I/O	
43	AD 0	I/O	

No.	Pin name	I/O	Function																																				
44	ASTB	O	Address strobe line for external memory																																				
45	V <sub>SS</sub>	-	GND																																				
46	MODE	I	Switch external ROM / internal ROM Fixed in H(external).																																				
47	EIO 0	I/O	<table border="1"> <tr> <td></td> <td>PAC-S10</td> <td>PAC-N10</td> <td>PAC-K1</td> </tr> <tr> <td>EIO 0</td> <td>IRQ</td> <td>C/D</td> <td>KARA LED</td> </tr> <tr> <td>1</td> <td>CDCK</td> <td>I/O</td> <td>KSOUT0</td> </tr> <tr> <td>2</td> <td>D/M</td> <td>REQ</td> <td>KSOUT1</td> </tr> <tr> <td>3</td> <td>HOCK</td> <td>ACK</td> <td>KSIN0</td> </tr> <tr> <td>4</td> <td>DBUS0</td> <td>DBUS0</td> <td>KSIN1</td> </tr> <tr> <td>5</td> <td>DBUS1</td> <td>DBUS1</td> <td>KSIN2</td> </tr> <tr> <td>6</td> <td>DBUS2</td> <td>DBUS2</td> <td>MICCON1</td> </tr> <tr> <td>7</td> <td>DBUS3</td> <td>DBUS3</td> <td>MICCON2</td> </tr> </table>		PAC-S10	PAC-N10	PAC-K1	EIO 0	IRQ	C/D	KARA LED	1	CDCK	I/O	KSOUT0	2	D/M	REQ	KSOUT1	3	HOCK	ACK	KSIN0	4	DBUS0	DBUS0	KSIN1	5	DBUS1	DBUS1	KSIN2	6	DBUS2	DBUS2	MICCON1	7	DBUS3	DBUS3	MICCON2
	PAC-S10	PAC-N10		PAC-K1																																			
EIO 0	IRQ	C/D		KARA LED																																			
1	CDCK	I/O		KSOUT0																																			
2	D/M	REQ		KSOUT1																																			
3	HOCK	ACK		KSIN0																																			
4	DBUS0	DBUS0		KSIN1																																			
5	DBUS1	DBUS1		KSIN2																																			
6	DBUS2	DBUS2	MICCON1																																				
7	DBUS3	DBUS3	MICCON2																																				
48	EIO 1	I/O	Pack interface																																				
49	EIO 2	I/O																																					
50	EIO 3	I/O																																					
51	EIO 4	I/O																																					
52	EIO 5	I/O																																					
53	EIO 6	I/O																																					
54	EIO 7	I/O																																					
55	V <sub>DD</sub>	-		Standard power supply																																			
56	PACKDEF	I	A/D input, detect Pack type																																				
57	EAD 1	I	A/D input, for barance VR input of PAC - K1																																				
58	EAD 2	I	A/D input, for echo VR input of PAC - K1																																				
59		I	Not used (L fixed)																																				
60	KIN 0	I	MEMORY key input																																				
61	KIN 1	I	PLAY key input																																				
62	KIN 2	I	LD OPEN key input																																				
63	KIN 3	I	CD OPEN key input																																				
64	AV <sub>DD</sub>	-	Standard power supply for A/D converter																																				
65	AV <sub>REF1</sub>	-	Reference voltage for A/D converter																																				
66	AV <sub>SS</sub>	-	GND for A/D converter																																				
67	ANO 0	O	D/A output, PAC - K1 DSP chip select																																				
68	ANO 1	O	D/A output																																				
69	AV <sub>REF 2</sub>	-	Reference voltage for D/A converter																																				
70	AV <sub>REF 3</sub>	-																																					
71	VSYNC	I	V - SYNC signal input for game																																				
72	SEL IR	I	Remote control signal input																																				
73	SHAKE	I	Communication handshake timing clock with mechanism control																																				
74	SOFT RST	I	RESET input from pack																																				
75	FG	I	FG input																																				
76	EINT1	I	General interrupt input, Communication start trigger with PAC - N10, switch KARAOKE/NORMAL with PAC - K1																																				
77	EINT2	I	General interrupt input																																				
78	SI	I	Social communication receive data																																				
79	RxD	I	Serial data input with UART																																				
80	TxD	O	Serial data output with UART																																				

■PD0178(CONT ASSY IC201)

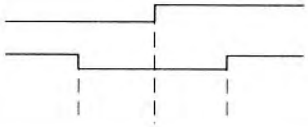
● Mechanism control IC

● Pin Function

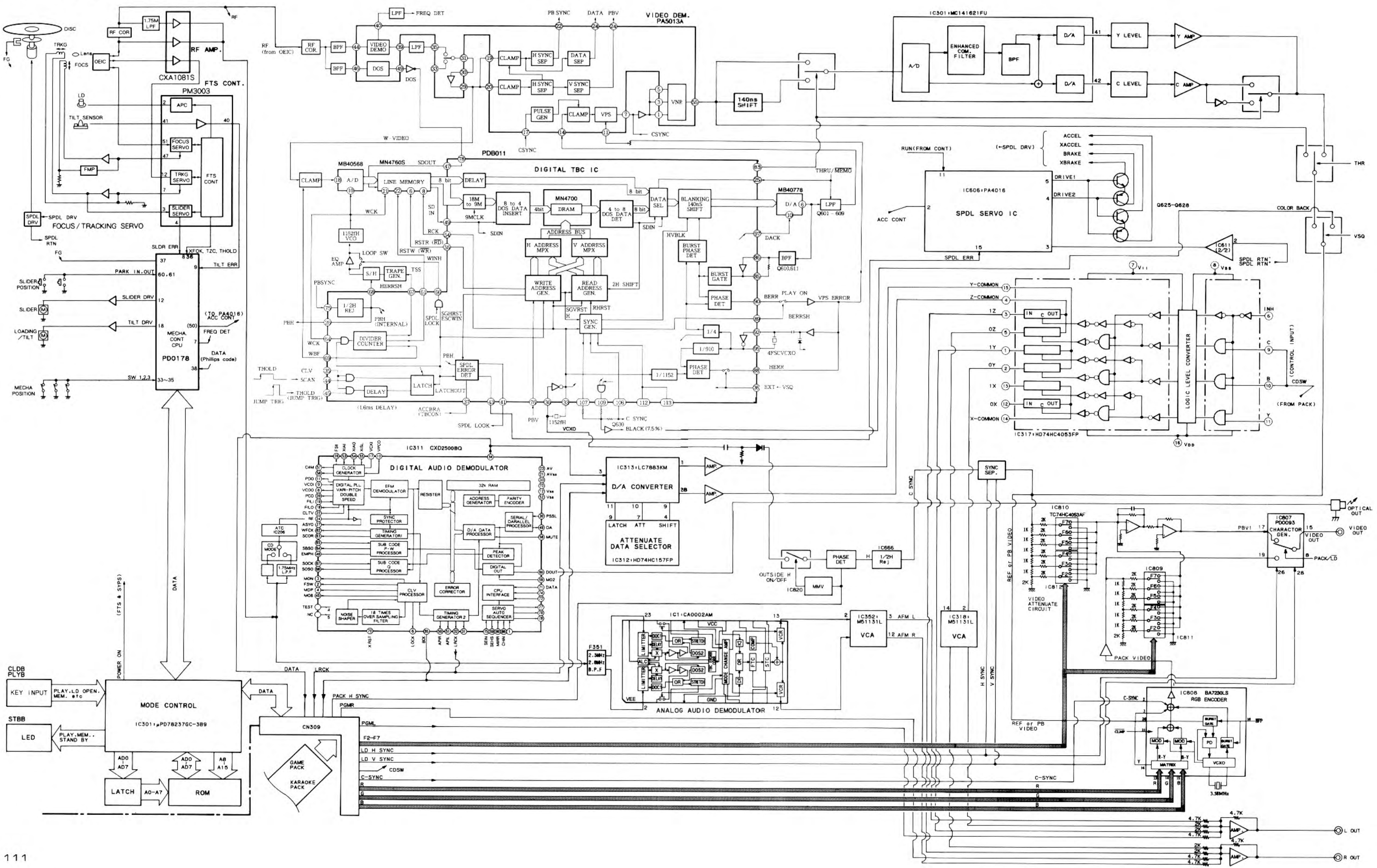
No.	Pin name	I/O	Function
1	VCC	—	Power supply connection pin. Set to 5V ±10%
2	XCX	O	Analog audio CX noise reduction switching signal output pin ON : L, OFF : H
3	SQ1	O	Alalog audio switching signal output pin 1/L Squelch : H When digital audio mode, the signal is output through the control of the EFM decoder IC : CXD2500BQ.
4	SQ2	O	Alalog audio switching signal output pin 2/R Squelch : H
5	XANA	O	Digital/analog audio switching signal output pin Digital : H, Analog : L Signals output by the line out and headphone are switched by the signal.
6	TBAL ERR	I	Tracking balance error signal input pin (analog signal) Signal is A/D converted and is input as the tracking offset control.
7	FREQ DET	I	RF detection signal input pin (analog signal) Inputs the A/D conversion of the RF detection output and is used in the spindle luff servo-mechanism. Voltage and frequency are proportional.
8	SLDR ERR	I	Pickup position detection switch input pin (analog signal) Drives the resistance among the switches, reads the value of the A/D input, and detects the position.
9	TILT ERR	I	Tilt sensor output signal input pin (analog signal) Inputs (0 to 5 V) the tilt sensor output amplified to a 40 to 50 dB signal. The signal is A/D converted and is input as the tilt sensor control. Controls the tilt motor until the signal is 2.5 V.
10	MUTE	O	Audio system audio mute control output pin MUTE ON : H, MUTE OFF : L
11	THR	O	Digital memory control output pin Through : H, Memory ON : L
12	SLDR DRV	O	Slider move drive signal output pin Drive the slider by changing the duty of the signal. Cycle : 36mS, 3-value control H : FWD direction, Z : OFF, L : REV direction
13	T OFF	O	Tracking operation control signal output pin The signal backups ON/OFF of the tracking servo operation. OFF : H, ON : L
14	GFS	I	CD(EFM signal) frame lock signal input pin Connected to pin 12 of the EFM decoder IC : CXD2500BQ. Lock : H, Unlock : L GFS is an abbreviation for Good Frame Sync.
15	SI2	I	EFM decoder IC : CXD2500BQ subcode input pin Reads the subcodes of SCK2 and the signal.
16	XLAT2	O	EFM decoder IC : CXD2500BQ control latch signal output pin Sends the control command using SO3 and 2500CLK
17	SCK2	O	EFM decoder IC : CXD2500BQ subcode read clock signal output pin Sets the clock to 96 and reads the subcode.
18	TBAL DRV	O	Tracking offset control signal output pin Outputs the tracking offset after PWM and is used in auto tracking offset. Cycle : 910µsec, 3-value control H, L, Z.
19	SITOM	I	Input pin of data from mode control IC Serial Used with the data signal to the character generator IC.
20	SMTOI	O	Serial data output to the mode control IC Serial
21	SCK	I/O	Clock for serial communication with the mode control IC In the input mode except during serial communication with the mode control IC. Used with the clock signal to the character generator IC.

No.	Pin name	I/O	Function
22	TZC	I	Input pin for Tracking Zero Cross signal from IC803 (PM3003)
23	SCOR	I	Subcode SYNC signal input pin Inputs the subcode signal from the EFM decoder IC : CXD2500BQ when the signal is "H". Supervises the disc playback depending on the presence of the signal.
24	DF LATCH	O	Digital filter (LC7883) serial control latch signal output pin
25	SHAKE	I/O	Pin of handshake signal for data communication with the mode control IC This pin is a bi-directional data path which sends the data transfer timing through the I/O mode switching of the respective microcomputers.
26	XPBV	I	LD/CDV playback V - SYNC signal input pin IC basically operates in synchronization (falling edge) with the signal. Setting the signal as reference in the CAV special playback mode, generates jump timing. V - SYNC on going : L
27	CN VSS	-	GND for A/D conversion
28	XRESET	I	Reset signal input pin    Reset : L,    Cancel reset : H This pin controlled by mode control.
29	XTAL IN	I	9 MHz clock generation input pin
30	XTAL OUT	O	9 MHz clock generation output pin
31	FTS CLK	O	Clock output pin for FTS IC
32	VSS	-	GND
33	SW1	I	Loading/tilt position detection switch input pin
34	SW2	I	Loading/tilt position detection switch input pin
35	SW3	I	Loading/tilt position detection switch input pin
36	XFOK	I	Focus lock signal input pin    Focus lock : L
37	FG	I	Spindle motor FG signal input pin 24 pulses per signal Divided into thirds and used inside the microcomputer
38	DATA	I	Input pin for Phillips code decoder in the mechanism controller
39	XPBH	I	Playback H - SYNC input for Phillips code decoder
40	XPBV	I	Playback V - SYNC input for Phillips code decoder
41	CAV/XCLV	O	CAV/CLV switching signal output pin    CAV : H    CLV : L Connected to pin 6 of PA5013A and used as a VIDEO NR switching signal.
42	XYCS	O	Y/C separation control output pin Y/C separation ON : L
43	AC CONT	O	Spindle acceleration signal output pin Acceleration : H,    Deceleration : L,    CD, stop and play : Z
44	TILT/LOAD DRV	O	Loading and tilt control signal output pin Output tilt drive in PWM format to control loading and tilt servo mechanism.
45	J. TRIG	O	Track jump signal output pin Used for single track jump Start of track : H,    Other : L,    Width of "H" : approx. 20µsec
46	SCK3	O	Serial 3 clock signal output pin Reads the rising edge H : Within 2µsec,    L : Within 20µsec.
47	SO3	O	Serial 3 data signal output pin With the serial data as the common signal, divides the signals into three types of latch signals (XLAT3, XLAT2, XT LATCH). LSB first



No.	Pin name	I/O	Function															
48	XLAT3	O	Spindle servo mechanism IC latch signal output pin															
49	WEN	O	Video memory write enable signal output pin Write enable : H, Freeze : L															
50	VSQ	O	Video output switching signal output pin Squelch : H, Playback video : L															
51	TBC ON	O	TBC control signal output pin During multi-track jump : H, Other : L															
52	RUN	O	Spindle motor ON/OFF control signal output pin ON(RUN) : H, OFF(STOP) : L															
53	XSLOCK	I	Spindle lock signal input pin Lock : L, Unlock : H															
54	XLD ON	O	Laser diode ON/OFF switching signal output OFF : H, ON : L															
55	POWER SAVE	O	Spindle drive circuit power save mode control output pin with IC606 (PA4016) Power save mode : H, Normal : L															
56	8INCH	O	Disc size detection signal output pin 8 inch : H, 12 inch : L Used for IC606 (PA4016) EQ switching.															
57	CDV	O	EQ switching detect signal output pin with IC606(PA4016) CDV : H															
58	SHUNT	O	CD/LD switching signal output pin CD, CDV - A : H LD, CDV - V : L															
59	SIP	O	Super-inpose signal output pin Super-inpose ON : H															
60	PARK IN	I	Slider position detect switch input pin <table border="1" style="display: inline-table; vertical-align: middle;"> <thead> <tr> <th>PARK IN</th> <th>PARK OUT</th> <th></th> </tr> </thead> <tbody> <tr> <td>L</td> <td>L</td> <td>CD active</td> </tr> <tr> <td>L</td> <td>H</td> <td>CD INSIDE</td> </tr> <tr> <td>H</td> <td>L</td> <td>CDV active</td> </tr> <tr> <td>H</td> <td>H</td> <td>LD active</td> </tr> </tbody> </table> 	PARK IN	PARK OUT		L	L	CD active	L	H	CD INSIDE	H	L	CDV active	H	H	LD active
PARK IN	PARK OUT																	
L	L	CD active																
L	H	CD INSIDE																
H	L	CDV active																
H	H	LD active																
61	PARK OUT	I																
62	RFCORR	O	RF correction switching signal output pin Gain up : H Increases gain (#8000 to #8100) within the CAV.															
63	EMMOD	I	Emergency mode input signal pin Emergency mode : H Sets forcibly video memory ON mode when "H" input four seconds. Reset is tray open.															
64	XOPM	O	Optical output mute output pin Mute Optical output : L															

# 10. BLOCK DIAGRAM



# 11. PANEL FACILITIES

**POWER SWITCH**  
Press to switch the power supply ON/OFF. When installing/detaching the Control Pack, ensure that the power supply is OFF.

**PLAY/STILL BUTTON**  
Press to perform playback of the disc. Press during performing playback of an LD or CDV disc, and the picture becomes still.

**STANDBY/ON INDICATOR**  
Illuminates green when the power supply is switched ON by the power switch. When the power supply is switched OFF by the remote control unit, the indicator lights up red.

**PACK RELEASE BUTTON**  
Press to release the Control Pack.

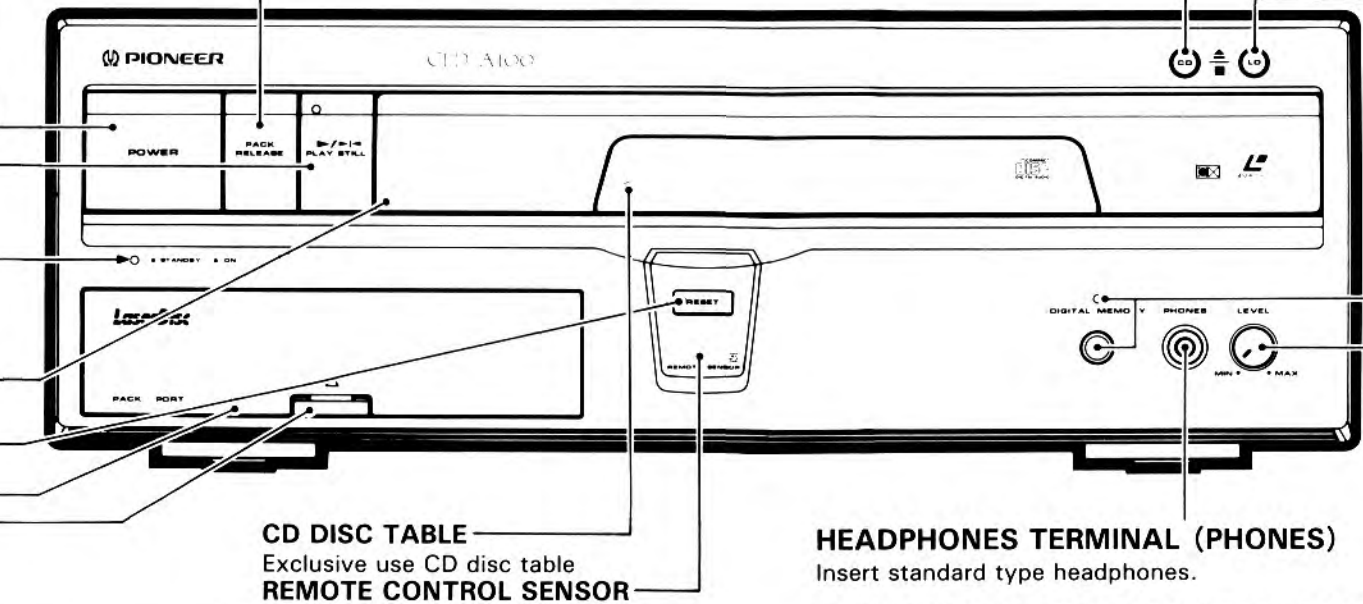
**CD STOP OPEN/CLOSE BUTTON (⏏)**  
Stops disc playback and open/closes the CD disc table

**LD STOP OPEN/CLOSE BUTTON (⏏)**  
Stops disc playback and open/closes the LD disc table

**DIGITAL MEMORY button/INDICATOR**  
When playing a CAV or CLV disc, turning the digital memory function ON allows you to enjoy special playback functions such as still frame and multi-speed playback with no screen disturbance. If the digital memory function is OFF, it will automatically turn ON when you fast-forward, fast-reverse or activate a special playback function (except with CAV discs). When digital memory is OFF, screen disturbance may occur momentarily when an operation such as fast-forward is carried out. However, horizontal resolution is better than when digital memory is ON.

**DISC TABLE**  
**RESET BUTTON**  
Resets the games software when playing games software utilized by the separately sold Control Pack.

**Control Pack installation slot**  
**Control Pack installation slot cover**  
Attach when the Control Pack is not installed.



**CD DISC TABLE**  
Exclusive use CD disc table

**REMOTE CONTROL SENSOR**

**HEADPHONES TERMINAL (PHONES)**  
Insert standard type headphones.

**HEADPHONES VOLUME ADJUSTMENT KNOB (LEVEL)**

**NOTES:**

- When using a special function obtained by connecting a commercially available adaptor (such as a caption adaptor), be sure to turn the digital memory function OFF. The adaptor will not function properly if digital memory is left ON.
- Screen disturbance may occur momentarily when an operation such as fast-forward, fast-reverse or a special playback function is carried out when digital memory is OFF. This is not a malfunction or disc defect.
- This player memorizes the ON/OFF condition of the digital memory function even if the power is turned off. Turn the digital memory function ON or OFF as required the next time you play a disc. The "DIGITAL MEMORY" indicator lights when digital memory is ON.

<p><b>INSTALLING THE CONTROL PACK</b></p> <ol style="list-style-type: none"> <li><b>1. Switch OFF the power supply to the main unit.</b></li> <li><b>2. Remove the Control Pack installation slot cover.</b> While lifting up the center of the cover with a finger nail, pull forward and detach.</li> <li><b>3. Insert the Control Pack into the interior of the main appliance.</b> To install accurately, lightly hold the main appliance by the top surface and carefully insert the Control Pack until the front panel is flush with the front panel of the player.</li> </ol> <p><b>NOTES:</b></p> <ul style="list-style-type: none"> <li>Carefully put the detached Control Pack installation cover somewhere for safekeeping, as it will be required when the Control Pack is removed from the main appliance.</li> <li>When the black lever protrudes in the top center of the Control Pack insertion slot and the Control Pack cannot be inserted, press in the RELEASE button.</li> </ul>	<p><b>1</b></p> <p><b>2</b></p>	<p><b>3</b></p>
<p><b>DETACHING THE CONTROL PACK</b></p> <ol style="list-style-type: none"> <li><b>1. Switch OFF the power supply to the main unit.</b></li> <li><b>2. To detach the Control Pack accurately, lightly hold the main appliance by the top surface and press the RELEASE button.</b> The Control Pack is partially ejected forward.</li> <li><b>3. Detach the Control Pack.</b></li> <li><b>4. Fit the Control Pack insertion slot cover.</b> First, introduce the top edge of the cover into the cover attachment slots on the main appliance, then fit the bottom edge into place.</li> </ol>	<p><b>1</b></p> <p><b>2</b></p>	<p><b>3</b></p>

# 12. SPECIFICATIONS

## 1. General

System .....Laser Vision Disc system and Compact Disc digital audio system  
 Laser .....Semiconductor laser wavelength 780 nm  
 Power requirements .....AC120 V, 60 Hz  
 Power consumption .....47W  
 Weight .....7.8 kg (17 lbs 3 oz)  
 Dimensions .....420 (W)×390.5 (D)×145 (H) mm  
 .....16-9/16 (W)×15-3/8 (D)×5-11/16 (H) in  
 Operating temperature .....+5°C—+35°C  
 .....(41°F—95°F)  
 Operating humidity .....5%—85%  
 (There should be no condensation of moisture.)

## 2. Disc

### Laser Vision Discs

\*Maximum playing times  
 12-inch standard play disc ..... 1 hour/both sides  
 12-inch extended play disc ..... 2 hours/both sides  
 8-inch standard play disc ..... 28 min/both sides  
 ..... 14 min/one side  
 8-inch extended play disc ..... 40 min/both sides  
 ..... 20 min/one side  
 Spindle motor speed  
 Standard play disc ..... 1,800 rpm  
 Extended play disc ..... 1,800 rpm (inner circumference)  
 ..... to 600 rpm (outer circumference)  
 (For a 12-inch disc)

### Compact Discs

DISC ..... Diameter: 5-inch, 3-inch, Thickness: 1.2 mm  
 Rotation direction (pickup side) ..... Counterclockwise  
 Linear speed ..... 1.2—1.4 m/sec  
 \*Maximum playing time ..... 74 min. 5-inch discs  
 ..... 20 min. 3-inch discs  
 (For stereo playback)

## 7. Functions

Remote control operations (CU-CLD085)

	Function	Standard-play Disc (CAV)	Extended-play Disc (CLV)	Compact Disc with Video	Compact Disc
Basic Functions	Single-side play	YES	YES	YES	YES
	Pause	YES	YES	YES	YES
	Stop	YES	YES	YES	YES
Search	Fast forward (forward and reverse)	YES	YES	YES	YES
	Chapter/track skip	YES	YES	YES	YES
	Direct Chapter/track number search	YES	YES	YES	YES
	Frame number search	YES	NO	NO	NO
	Time number search	NO	YES	YES	YES
Time display	Elapsed time display	NO	YES	YES	YES
	Absolute time display	YES <sup>*1</sup>	NO	NO	YES
	Remaining track time display	NO	NO	YES <sup>*4</sup>	YES
	Remaining total time display	YES <sup>*1</sup>	YES <sup>*1</sup>	YES	YES
	Total number of selections, total time display	YES <sup>*1</sup>	YES <sup>*1</sup>	YES	YES
Others	CX system ON/OFF	YES <sup>*2</sup>	YES <sup>*2</sup>	NO	NO
	Auto Digital/Analog switch	YES <sup>*3</sup>	YES <sup>*3</sup>	NO	NO
	Audio channel selection (stereo, 1/L, 2/R)	YES	YES	YES	YES

\*1 Only discs with TOC

\*2 Valid for analog sound playing a disc with the  mark.

\*3 Can only be used with discs with digital sound tracks.

\*4 Audio part only

### NOTE:

The specifications and design of this product are subject to change without notice, due to improvements.

## Compact Discs with Video

Disc ..... Diameter: 5-inch, Thickness: 1.2 mm  
 Rotation direction (pickup side) ..... Counterclockwise  
 Linear speed ..... Audio portion: 1.2—1.4 m/sec  
 ..... Video portion: 11—12 m/sec  
 \*Maximum playing time ..... Video portion: 5 min. (CLV)  
 ..... Audio portion: 20 min. (Digital)

\*Actual playback time differs for each disc.

## 3. Video characteristics (two pairs)

Format ..... NTSC specifications  
 Video output  
 Level ..... 1 Vp-p nominal, sync. negative, terminated  
 Impedance ..... 75 Ω unbalanced  
 Jacks ..... Both RCA jacks

## 4. Audio characteristics (two pairs)

Output level  
 During analog audio output ..... 200 mVrms  
 ..... (1 kHz, 40%)  
 During digital audio output ..... 200 mVrms  
 ..... (1 kHz, -20 dB)  
 Jacks ..... Both RCA jacks  
 Number of channels ..... 2

## 5. Other Terminals

Control input/output ..... Both miniature jacks  
 Optical digital output ..... Optical digital jack  
 VHF ADAPTER Output ..... JA—RF3L

## 6. Accessories

Remote control unit (CU-CLD085) ..... 1  
 Size "AAA" (IEC R03) dry cell batteries ..... 2  
 Video cord ..... 1  
 Audio cord ..... 1  
 Operating instructions ..... 1  
 Warranty card ..... 1

## PLAYER FUNCTIONS

- LaserActive compatible
- Digital Sound for LaserVision Discs
- Picture Stop Cancel Function
- Last Memory
- Digital Video Memory.

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